

Cave-dwelling pseudoscorpions (Arachnida, Pseudoscorpiones) from Brazil

Volker MAHNERT

Muséum d'histoire naturelle, case postale 6434, CH-1211 Geneva 6, Switzerland.

E-mail: volker.mahnert@mhn.ville-ge.ch

Cave-dwelling pseudoscorpions (Arachnida, Pseudoscorpiones) from Brazil. - Pseudoscorpions collected in about 100 caves have been studied and 25 species of seven families identified. Two new genera - *Spelaeobochica* (Bochicidae) (type species *allodentatus* sp. n.) and *Spelaeochernes* (Chernetidae) (type species *dentatus* sp. n., with 7 other new species) - are described, together with 10 additional new species in the genera *Pseudochthonius* (Chthoniidae), *Ideoroncus* (Ideoroncidae), *Progarypus* (Olpidae), *Cheiridium* (Cheiridiidae) and *Zaona* (Chernetidae: previously known from its type species from Florida only). *Geogarypus itapemirimensis* Feio is redescribed and transferred to the genus *Cheiridium*.

Key-words: cave fauna - taxonomy - pseudoscorpions - Brazil - new taxa.

INTRODUCTION

Knowledge of Neotropical pseudoscorpions in general, and of the cave-dwelling species in particular, is fragmentary and we do not have well founded estimates of the diversity of the pseudoscorpion fauna of any South American region, apart from perhaps the Amazon region (Adis & Harvey, 2000) and Chile (Beier, 1964). Data on cave-inhabiting pseudoscorpions from continental South America are even rarer, since only 17 species of five families have been recorded from caves in Brazil, Peru, Uruguay and Venezuela (Beier, 1959, 1969, 1970; Mahnert, 1985, 1994; Mahnert & Andrade, 1998), unidentified species in the genera *Bochica* (Bochicidae), *Lustrochernes*, *Parachernes*, *Tejachernes* (Chernetidae), and *Parawithius* (Withiidae) have been mentioned by Heurtault (1994) from caves of Venezuela and Peru. Of all these species, only two of the family Chthoniidae (*Tyramochthonius ribeirai* Mahnert from Peru and *Pseudochthonius strinatii* Beier from Brazil) might be considered as troglobionts. The remaining species belong to various genera of the families Lechytiidae, Chthoniidae, Olpiidae, Withiidae and Chernetidae and may be considered as troglophiles.

Twelve invertebrate and one vertebrate species had been recorded from Brazilian caves during the first half of the 20th century (Trajano, 1993; Trajano & Sanchez, 1994; Pinto-da-Rocha, 1995), but a systematic biospeological survey only started in the decade of 70 following the collecting visit to caves in Sao Paulo State by Pierre

Strinati (Geneva) (Strinati, 1971, 1975) and the discovery of 10 new invertebrate species, including the first pseudoscorpion, *Pseudochthonius strinati*, described by Beier (1969).

It was therefore with great interest that I accepted, from 1989 onwards, a large and ever increasing collection of pseudoscorpions from Brazilian caves for study, collected by Dra Eleonora Trajano, Dr Pedro Gaspini (Dept. de Zoologia IBUSP), Dr Ricardo Pinto-da-Rocha (Museu de Zoologia USP) and collaborating speleologists.

The holotypes and paratypes of the new species are deposited in the collection of the Museo de Zoologia of the University of São Paulo; some paratypes are also deposited at the Museum of Natural History of Geneva.

DESCRIPTIONS

TRIDENCHTHONIIDAE

Cryptoditha cf. *elegans* (Beier, 1931)

Figs 1-4

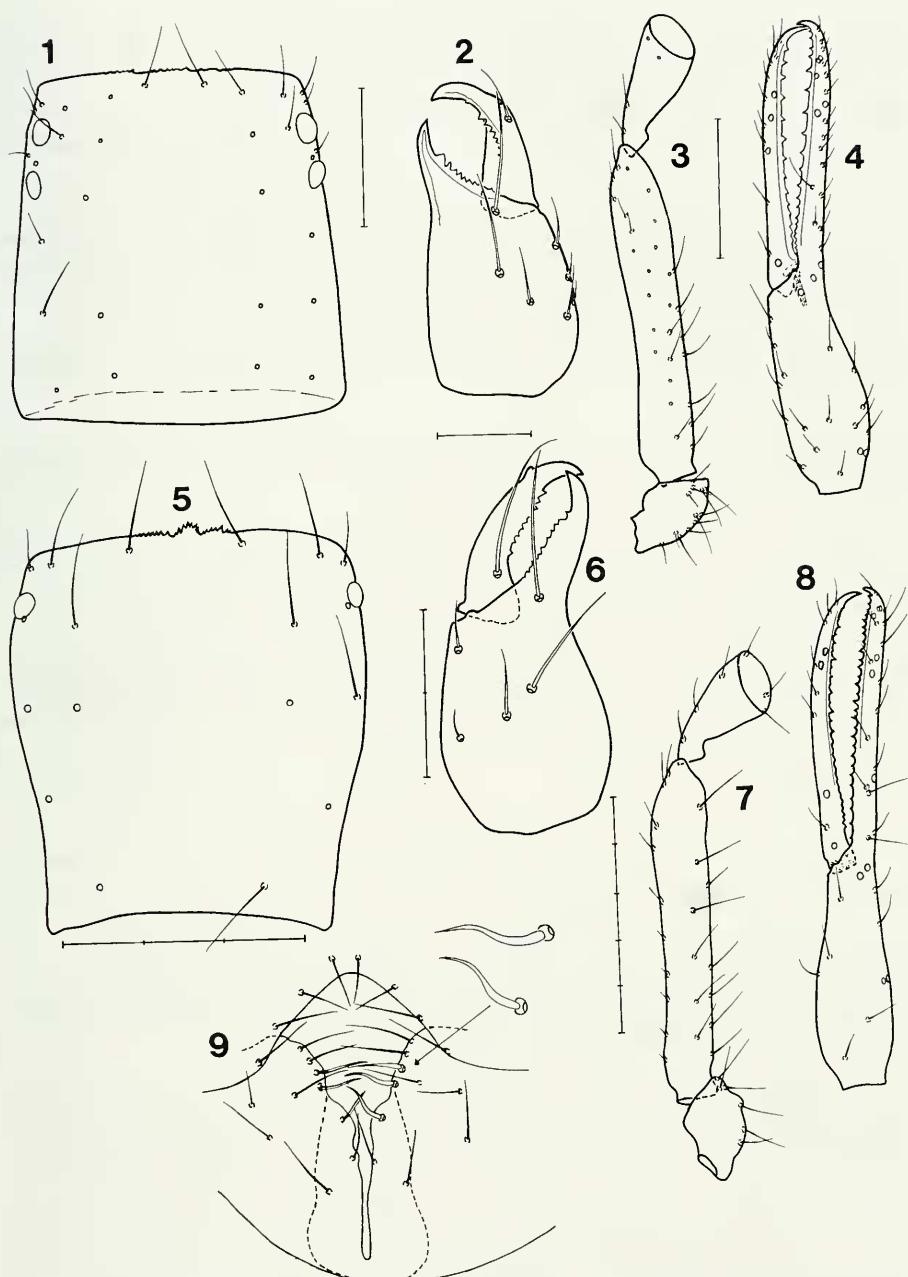
Material: Minas Gerais, Gruta de Malmeiro, Matozinhos, Ig. Lilia Senna Horta, 15.X.1995: 1♀.

Description: Carapace (fig. 1) with 28 macrosetae; 4 eyes; tergites I-V 6 setae, VI 7, VII-IX 8, X 6, XI 6 (2 tactile setae); coxae I with 5, II with 3 coxal spines, intercoxal tubercle absent; Chelicera (fig. 2): 5 large and 2 accessory setae on palm, movable finger with 8 acute teeth and one small, isolated, subapical tooth; spinneret absent, flagellum 9 dentate setae. Pedipalps (figs 3-4): femur 6.2 times longer than broad, patella 2.4 times, hand 2.4 times longer than deep, chela 5.5 times, finger 1.3 times longer than hand; fixed finger with 18 mostly acute and distinctly spaced teeth, movable finger with 14 acute, basally decreasing teeth, a long sclerotized internal apodeme present at base of movable finger. Leg IV: femur+patella 3.2 times, tibia 4.7 times, basitarsus 3.5 times, telotarsus 11.4 times longer than deep, both tarsi with a long tactile seta each.

Measurements (in mm): Palps: femur 0.73/0.12, patella 0.29/0.12, hand 0.45/0.18, finger length 0.57, chela length 1.02. Leg IV: femur+patella 0.57/0.18, tibia 0.39/0.08, basitarsus 0.22/0.06, telotarsus 0.41/0.04.

Cryptoditha elegans was described from Passa Quatro (Minas Gerais) and subsequently recorded by Beier (1974) from Santa Catarina. The specimen studied here differs from the description of the type by the more slender pedipalps, lower tooth counts and larger size. Specimens identified as this species from Santa Catarina (Beier 1974), São Paulo and Paraguay (unpublished) are specifically distinct from the specimens from Matozinhos (e.g. they do not present a sclerotized internal apodeme at the base of the movable finger). A number of undescribed species of this genus exist in museum collections and the state of this character is unknown in *elegans*, the type specimens of which are apparently lost. Specimens are needed from the type locality of *elegans* to clarify the identity of this and the other species occurring in the area.

A tritonymph belonging to this genus, from the Gruta do Moquem (Iporanga, SP; Ig. E. Trajano & P. Gaspini, 30.VIII.1992; MZUSP 13835), cannot be identified at present.



FIGS 1-4; *Cryptoditha* cf. *elegans* (Beier) ♀; 1: carapace; 2: chelicera; 3-4: pedipalp; scale unit 0.1mm.

FIGS 5-9; *Pseudochthonius gracilimanus* sp. n. ♂; 5: carapace; 6: chelicera; 7-8: pedipalp; 9: genital opening; scale unit 0.1mm.

LECHYTIIDAE

Lechytiella chthoniiformis (Balzan, 1887)

Lechytiella sp. (111); Pinto-da-Rocha, 1995: 84 (MS-15).

Material: Mato Grosso do Sul, Gruta do Curé, Bonito, lg. E. Trajano & P. Gnaspi, 17.X.1990: 1 ♀.

Tergites I-IX 6 setae (II, IX exceptionally 5), X 4, XI 6 (2 sublateral tactile setae); apical manducatory seta bifid. Pedipalps: femur 3.7 times longer than broad, patella 1.8 times, hand of chela 1.6 times longer than deep, chela 3.6 times, finger 1.3 times longer than hand; fixed finger with 4 small cuspid teeth, 6 low and large and 15 rudimentary teeth; movable finger with 3 anterior cuspid and about 17 rudimentary teeth. Leg IV: femur+patella 1.9 times, tibia 3.6 times, basitarsus 2.4 times, telotarsus 8.8 times longer than deep.

Measurements (in mm): Palps: femur 0.32/0.09, patella 0.18/0.10, hand 0.21/0.13, finger length 0.27, chela length 0.46. Leg IV: femur+patella 0.34/0.17, tibia 0.23/0.06, basitarsus 0.13/0.05, telotarsus 0.22/0.03.

The present specimen conforms to the description of Brazilian specimens of this species given by Aguiar & Bührnheim (1992) and is identical in all respects with specimens from various localities in Paraguay (males also present bifurcate setae flanking the genital opening). It belongs to the first group defined by Muchmore (1975), called the *arborea*-group by Judson (1992) and Muchmore (2000), having the apical manducatory seta bifid and tergite XI with 6 setae (2 tactile). The hypertrophied glandular pits of the telotarsi, recorded by Judson (1992) for *Lechytiella natalensis* (Tullgren) and by Muchmore (2000) for *L. sakagamii* Morikawa, are also present in this species.

CHTHONIIDAE

Pseudochthonius gracilimanus sp. n.

Figs 5-9

Pseudochthonius sp. (113); Pinto-da-Rocha, 1995: 84 (BA-69, BA-72).

Material: Bahía, Gruta Azul, Iraquara, lg. E. Trajano & P. Gnaspi, 31.VIII.1991: 1 ♂ (holotype) 1 ♀ (paratype) (MZUSP 13778); Gruta do Impossível, Palmeiras, lg. L. Senna Horta, 18.II.1996: 1 ♂ 2 ♀ (paratypes); Lapa II, Santa Rita cave system, Iraquara, lg. E. Trajano & P. Gnaspi, 21.VII.1991 (MZUSP 13782): 1D (non-type).

Description: Yellowish-brown; carapace reticulate, 1.1-1.2 times as long as broad, 2 small eyes present, anterior margin medially dentate, with a prominent dentate epistome. 18 strong setae (6/4/4/2/2): tergites III-V with round medial spot, I-V 4 setae, VI-IX 6, X 4 XI 6 (2 submedial tactile setae); apical lobe of palps 2 setae, palpal coxa 3 (1 discal seta), coxa I 5+ 2-5 dentate coxal spines, II 4-5+3-5 dentate coxal spines, III 7-8, IV 8, intercoxal tubercle absent; anterior genital operculum 7-8 setae, genital opening of male with 6 marginal (3 basal ones curved, see fig. 9) and 2 discal setae on each side; sternite III 8-10(13)+3 suprastigmal setae, IV 9-10+3-4 suprastigmal setae, V-VIII 6-8 (lateral setae shortened), IX 6, X 5 (2 tactile setae), XI 0; anal cone 0/2 setae. Chelicera (fig. 6): palm with 5 setae, fixed finger with 8-11

acute teeth (distal one slightly isolated), movable finger with 10-12 teeth, spinneret tooth-like (smaller in male), serrula exterior 16 blades, flagellum 9(?) setae (first only shortly dentate). Palps (figs 7-8): femur 6.4-6.5 times as long as broad, 1.45-1.59 times longer than carapace and 2.76-2.91 times longer than patella, chaetotaxy: 4-5/6/2/8; patella 2.0-2.2 times, hand 2.9-3.1 times as long as deep, chela 6.7-7.40 times, finger 1.24-1.39 times longer than hand. Fixed finger with 1 distal lateral tooth, 23-26 pointed, heterodont teeth and 2 flattened rounded teeth, movable finger with distally 2-3 rounded teeth, 13 acute, heterodont teeth and 10-14 rounded teeth; trichobothria: *ist* halfway between *esb* and *est*, one sensillum distal to *sb*. Leg I (male): femur 6.0 times as long as deep and 1.89 (1.77 in female) longer than patella, which is 4.1 times, tibia 6.0 times, tarsus 11.0 times as long as deep; leg IV: femur+patella 2.6-3.0 times, tibia 4.6-4.7 times, basitarsus 3.7-3.9 times (TS of tactile seta=0.33-0.36), telotarsus 11.6-11.7 times as long as deep, TS 0.10.

Measurements (in mm): Carapace 0.47-0.51/0.45-0.47; palps: femur 0.72-0.78/0.11-0.12, patella 0.25-0.27/0.12-0.13, hand 0.43-0.48/0.14-0.16, finger length 0.59-0.64, chelal length 1.02-1.10; leg I: femur 0.39-0.40/0.07, patella 0.21-0.22/0.05, tibia 0.24/0.04, basitarsus 0.24/0.04, telotarsus 0.38-0.39/0.03; leg IV: femur+patella 0.60-0.64/0.21-0.23, tibia 0.39/0.08, basitarsus 0.22-0.23/0.06, telotarsus 0.43/0.04.

The affinities of the new species are uncertain within the South American group of species characterized by the distal position of trichobothrium *ist* (halfway between *esb* and *est*) (*pulchellus* Ell., *singuini* Balzan, *homodentatus* Chamb., *heterodontatus* Hoff and *insularis* Chamb.). It is characterized by the straight and spaced dentition of the movable chelal finger and its palpal dimensions.

Pseudochthonius strinatii Beier, 1969

Fig. 10

Chthoniidae (110); Pinto-da-Rocha, 1995: 84 (SP-21, SP-41).

Pseudochthonius strinatii (112); Pinto-da-Rocha, 1995: 84 (SP-18).

Pseudochthonius sp. (113); Pinto-da.-Rocha, 1995: 84 (SP-02).

Pseudochthonius sp. (114); Pinto-da-Rocha, 1995: 84 (SP-21).

Material: São Paulo, Caverna Areias de Cima, Iporanga, lg. E. Trajano & P. Gnaspi, 23.III.1986 (MZUSP 13819): 1♂; Jacupiranga region, Caverna Tapagem, Eldorado, lg. E. Trajano & P. Gnaspi, 18.XI.1991 (MZUSP 13823): 1♂; Caverna Morro Preto, Iporanga, lg. E. Trajano, I/II.1985 (MZUSP 10295): 1♀; same cave, in guano of frugivorous bats, lg. P. Gnaspi Netto, 31.VIII.1986 (MZUSP 10296): 1♂; Minas Gerais, Buraco (=Lapa?) do Medo, Sete Lagoas, lg. L. Senna Horta, 30.IV.1995: 1♀ IT; Lapa Vermelha I, Pedro Leopoldo, in guano, lg. L. Senna Horta, 28.X.1995: 1T; Lapa Vermelha, Pedro Leopoldo, lg. F. Chaimowicz, without date: 1♀; Paraná, Gruta do Rocha, Adrianópolis, lg. R. Pinto da Rocha & N. Moracchioli, 10.III.1991: 1T.

Two tritonymphs from "Caverna Santana, Iporanga, SP, lg. E. Trajano, 12.VII.1985 (MZUSP 10293)" probably also belong to this species.

Description: Carapace 1.0-1.2 times as long as broad, in some specimens indistinct eye-spots (e.g. ♂ from Areais de Cima) or eyes (Caverna Morro Preto) are visible; pedipalpal femur 5.3-6.1 (♂)/5.8-6.8 (♀) times as long as broad and 2.51-2.63 (♂) (♀: 2.31-2.52) times longer than patella and 1.3 times longer than carapace; patella 2.0-2.2 (♀ 2.2-2.5) times, hand 2.1-2.3 times as long as deep, chela 6.4-7.0 times; fixed finger 2.0-2.3 times longer than hand; both fingers with 33-43 acute,

spaced teeth, those of fixed finger arranged in two slightly offset rows (like teeth of a saw), simulating heterodonty mainly in the distal half of finger. Leg I: femur 5.5-5.9 times as long as deep and 1.73-1.88 times longer than patella, which is 3.8-4.4 times as long as deep, tibia 4.8-5.6 times, tarsus 9.5-10.7 times as long as deep; leg IV: femur+patella 2.7-3.3 times, tibia 4.8-5.0 times, basitarsus 3.4 times, a longer seta near basal third, telotarsus 9.9-11.4 times as long as deep, a longer seta at its base.

Measurements (in mm) (♀ in parentheses): Carapace 0.42-0.46/0.40-0.42 (0.48-0.54/0.45-0.47); pedipalps: femur 0.57-0.66/0.11 (0.70-0.73/0.10-0.12), patella 0.22-0.25/0.11-0.12 (0.29-0.31/0.12-0.14), hand 0.25-0.31/0.12-0.14 (0.33-0.35/0.15-0.16), finger length 0.57-0.64 (0.69-0.70), chela length 0.82-0.93 (1.02-1.06); leg I (1♂, 3♀): femur 0.34/0.06 (0.38-0.39/0.07), patella 0.18/0.05 (0.21-0.22/0.05-0.06), tibia 0.19/0.04 (0.22-0.23/0.04-0.05), tarsus 0.33/0.03 (0.37-0.39/0.04); leg IV (1♂, 2♀): femur+patella 0.49/0.17 (0.56/0.17-0.21), tibia 0.32/0.07 (0.37/0.07-0.08), basitarsus 0.17/0.05 (0.20-0.21/0.06), telotarsus 0.34/0.03 (0.38-0.41/0.04).

This species was described from the female holotype, collected from the "Grutas das Areias, São Paulo" (=Caverna Areias de Cima, Iporanga?). It is well characterized by its size, morphometrical characters of pedipalps, absence or strong reduction of eyes (see Beier, 1969) and its chelal dentition.

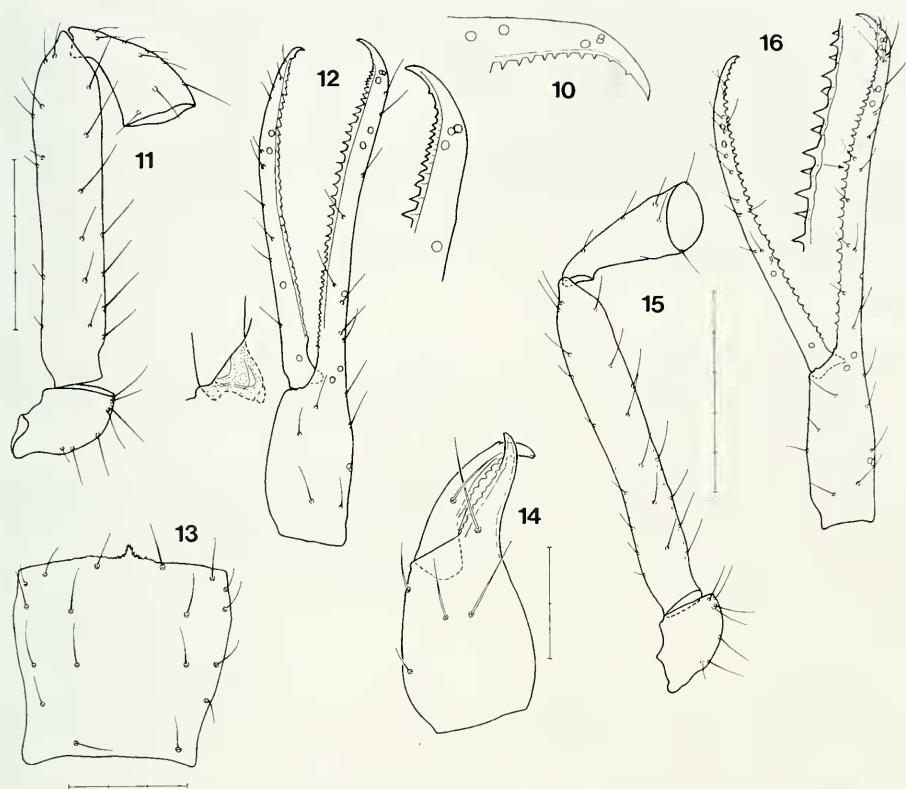
Pseudochthonius ricardoi sp. n.

Figs 11-12

Pseudochthonius sp. (113); Pinto-da-Rocha, 1995: 84 (SP-25; MG-396).

Material: São Paulo, Caverna Água Suja, Iporanga, Vale do Betari, Ig. E. Trajano & P. Gnaspi. 20.IV.1991(MZUSP 13817): 1♀ (holotype); Minas Gerais, Gruta Tamboril, Unfa, Ig. Gregeo, 22.V.1989 (MZUSP 13802): 1♂ (non-type).

Description: Yellowish-brown: carapace nearly as long as broad, 2 indistinct eye-spots present, anterior margin medially dentate, with a prominent dentate epistome, 16 strong setae (4/4/4/2/2) and a preocular microseta present on each side; tergites II-V with round medial spot, I-V 4 setae, VI-IX 6, X 4 XI 6 (2 submedial tactile setae); apical lobe of palps 2 setae, palpal coxa 3 (1 discal seta), coxa I 5+4 dentate coxal spines, II 5+5 dentate coxal spines, III 6, IV 8, intercoxal tubercle absent; anterior genital operculum 7 setae, sternite III 10+3 suprastigmal setae, IV 10+3 suprastigmal setae, V-VIII 8 (lateral setae shortened), IX 6, X 5 (2 tactile setae), XI 0; anal cone 0/2 setae. Chelicera: palm with 5 setae, fixed finger with 12 pointed teeth (distal one slightly separated), movable finger with about 10 teeth (distal one slightly isolated), spinneret tooth-like. Palps (figs 11-12): femur 5.1 times as long as broad, 1.35 times longer than carapace and 2.45 times longer than patella, chaetotaxy: 4/6/3/5; patella 1.9 times, hand 1.8 times as long as deep, chela 6.0 times, finger 2.3 times longer than hand. Fixed finger with 43 acute, apparently heterodont teeth (decreasing in size basally), about 7 teeth near *et* contiguous, movable finger with 43 retrotruncate and basally rounded teeth; trichobothria: *ist* close to *esb* (ratio distance *ist-est/ist-esb* = 1.98). Leg I: femur 5.1 times as long as deep and 1.72 longer than patella, which is 3.7 times, tibia 5.3 times, tarsus 10.1 times as long as deep; leg IV: femur+patella 2.6 times, tibia 4.5 times, basitarsus 3.2 times, telotarsus 10.6 times as long as deep, basi- and telotarsus each with a tactile seta.



FIGS 10-16

10: *Pseudochthonius strinatii* Beier, distal dentition of fixed chelal finger; 11-12: *Pseudochthonius ricardoi* sp. n. ♀, pedipalp; 13-16: *Pseudochthonius biseriatus* n.sp.; 13: carapace; 14: chelicera; 15-16: pedipalp; scale unit 0.1mm.

Measurements (in mm): Carapace 0.47/0.45; palps: femur 0.63/0.12, patella 0.26/0.14, hand 0.27/0.15, finger length 0.63, chelal length 0.90; leg I: femur 0.37/0.07, patella 0.21/0.06, tibia 0.23/0.04, tarsus 0.38/0.04; leg IV: femur+patella 0.56/0.21, tibia 0.38/0.08, basitarsus 0.20/0.06, telotarsus 0.39/0.04.

The tritonymph from Gruta Tamboril shares with the holotype the distinctive dentition of the fixed chelal finger. Carapace with prominent dentate epistome, no distinguishable eyes or eye-spots, chaetotaxy: 4+1 preocular seta/4/4/2/2, tergites I-IV 4 setae; coxal spines serrate, 3 on coxa I, 4 on II; cheliceral palm with 5 setae, both fingers with pointed teeth, those in distal part of finger well separated, spinneret small, tooth-like, serrula exterior 15 blades; palpal hand 1.8 times as long as deep (0.19/0.11mm), chela 5.8 times, length 0.62mm, finger 2.24 times longer than hand, length 0.43mm.

The basal position of trichobothrium *ist* and the retrotruncate dentition of the movable chelal finger places the new species in the group of *brasiliensis* Beier, *strinatii* Beier and *tuxeni* Mahnert (Beier, 1970; Mahnert, 1979). It shares with *tuxeni* (from Santarém, Amazonas) the distinctive dentition of the fixed chelal finger (some teeth contiguous distally), but is easily separated by its larger size (chela length 0.90mm vs. 0.41mm), higher tooth counts on the chelal finger and more slender pedipalps. All other *Pseudochthonius* species recorded from the area (*brasiliensis*, *strinatii*, *biseriatus* sp. n., *gracilimanus* sp. n.) possess clearly spaced teeth near the fingertip.

Etymology: named in honour of Dr. Ricardo Pinto-da-Rocha, Museum of São Paulo.

***Pseudochthonius biseriatus* sp. n.**

Figs 13-16

Material: Minas Gerais, Gruta Olhos d'Água, Itacarambi, Ig. P. Gnaspi, 30.III-2.IV. 1994: 1♀ (holotype), 1♀ 1♂ (paratypes) (♀ paratype MHNG).

Description: Yellowish-brown; carapace reticulate, as long as broad, eyes absent, anterior margin with a prominent dentate epistome, 16 strong setae (4/4/4/2/2), one preocular seta present on each side; tergites whitish-yellow, III-V with round medial spot, I-II 2 setae, III 4, VI 4-6, V-IX 6, X 4 XI 4(?) (2 submedial tactile setae); apical lobe of palps 2 setae, palpal coxa 3 (1 discal seta), coxa I 5+ 3-4 dentate coxal spines, II 5+5-6 dentate coxal spines, III 7-8, IV 8, intercoxal tubercle absent; anterior genital operculum 6(♂)-8(♀) setae, genital opening of male with 6 marginal setae on each side; sternite III 9-12+3 suprastigmal setae, IV 10+3 suprastigmal setae, V-VIII 7-8(9) (lateral setae shortened), IX 6 (7), X 4-5 (2 tactile setae), XI 0; anal cone 0/2 setae. Chelicera (fig. 14): palm with 5 setae, fixed finger with 9-11 acute teeth (distal ones slightly separated), movable finger with 8-10 teeth, spinneret tooth-like (absent in male), serrula exterior about 20 blades, flagellum 9 setae (first only shortly dentate). Palps (figs. 15-16): femur 6.4-6.6 times longer than broad, 1.69 times longer than carapace and 2.30-2.38 times longer than patella, chaetotaxy: 5/6/4/6; patella 2.2-2.5 times, hand 2.3-2.4 times as long as deep, chela 7.5-8.0 times, finger 2.3 times longer than hand. Fixed finger with 1 distal lateral tooth, 37-41 pointed teeth (arranged like offset saw teeth and therefore giving the impression of heterodonty), movable finger with 34-37 acute, spaced teeth; trichobothria: *ist* much nearer to *esb* than to *est* (*ist-est/ist-esb* = 1.78-2.10), one sensillum distal to *sb*. Leg I: femur 6.1-6.2 times as long as deep and 1.74-1.77 longer than patella, which is 4.2-4.5 times, tibia 4.9-5.3 times, tarsus 10.4-11.3 times; leg IV: femur+patella 3.1-3.4 times, tibia 5.0-5.2 times, basitarsus 3.5-3.8 times (TS=0.32-0.33), telotarsus 10.6-11.9 times as long as deep, with basal tactile seta.

Measurements (in mm): Carapace 0.52-0.56/0.52-0.57; palps: femur 0.87-0.95/0.13-0.15, patella 0.37-0.41/0.15-0.17, hand 0.37-0.42/0.16-0.18, finger length 0.86-0.97, chelal length 1.24-1.39; leg I: femur 0.45-0.50/0.07-0.08, patella 0.25-0.28/0.06, tibia 0.24-0.28/0.05, tarsus 0.47-0.50/0.04-0.05; leg IV: femur+patella 0.68-0.76/0.20-0.23, tibia 0.44-0.46/0.09, basitarsus 0.24-0.26/0.07, telotarsus 0.48-0.51/0.04.

The basal position of trichobothrium *ist* and the straight, spaced teeth of the movable chelal finger suggest affinities of this new troglobite(?) species with *orthodactylus* Muchmore (from Amazonia). It is characterized by the presence of only 2 setae on tergites I and II and can be easily distinguished from *orthodactylus* by its larger size and more slender pedipalps. Species of the *brasiliensis* group are characterized by the dense, retrotruncate dentition of the movable chelal finger.

Etymology: *biseriatus* (lat., in two series) refers to the arrangement of chelal teeth.

SYARINIDAE

Nannobisium beieri Mahnert, 1979

Material: Pará, Gruta Pedra Cachoeira, Altamira, Ig. E. Trajano, 22.X.1988: 1♂ (MZUSP 10283); same cave, guano of insectivorous bats, Ig. E. Trajano, 22.X.1988: 3 ex.

The species is known from the region of Santarém (Pará); the specimens studied are slightly larger than the type specimens, but correspond perfectly to other specimens recorded subsequently. Palpal femur 3.1 times as long as broad (0.20/0.06mm), patella 2.0 times (0.17/0.09), hand 1.4 times (0.17/0.12), finger length 0.16mm, chela 2.6 times (2.4 times without pedicel), chelal length 0.32mm; both fingers with 13 teeth. Trichobothrium *t* apically lanceolate.

IDEORONCIDAE

Ideoroncus setosus Mahnert, 1984

Material: São Paulo, Caverna Casa de Pedra, Iporanga, in guano, Ig. P. Gaspini Netto, 25.V.1986: 1♂ 1♀ (MZUSP 10305).

Known previously from the regions of Palmeirinha and Baraqueçaba (Serra do Mar), São Paulo State. The present specimens correspond well to the original description; the palpal femur (female) is 4.5 times as long as broad; there are 26 teeth on the fixed finger and 21 on the movable finger. Only 19 trichobothria are present on the left chela of the female: *est*₆ is lacking (*est*₅₋₆ appear during the moult from tritonymph to adult).

Ideoroncus cavicola sp. n.

Figs 17-21

Ideoroncus sp. (115); Pinto-da-Rocha, 1995: 85 (PR-06; SP-18)

Material: São Paulo, Caverna Areias de Cima, Iporanga, Ig. P. Gaspini Netto, 20.XII.1986: 1♀ (holotype) (MZUSP 10301); same cave, Ig. P. Gaspini Netto, 31.VIII.1986: 1♂ (MZUSP 10300) (paratype); Alambari de Baixo, Iporanga, Ig. R. de Andrade, 8.V.1998: 1♀ (paratype); Paraná, Gruta de Lacinhas, Rio Branco do Sul, Ig. P. Gaspini Netto, 6.III.1988: 1♀ (MZUSP 10308) (non-type);

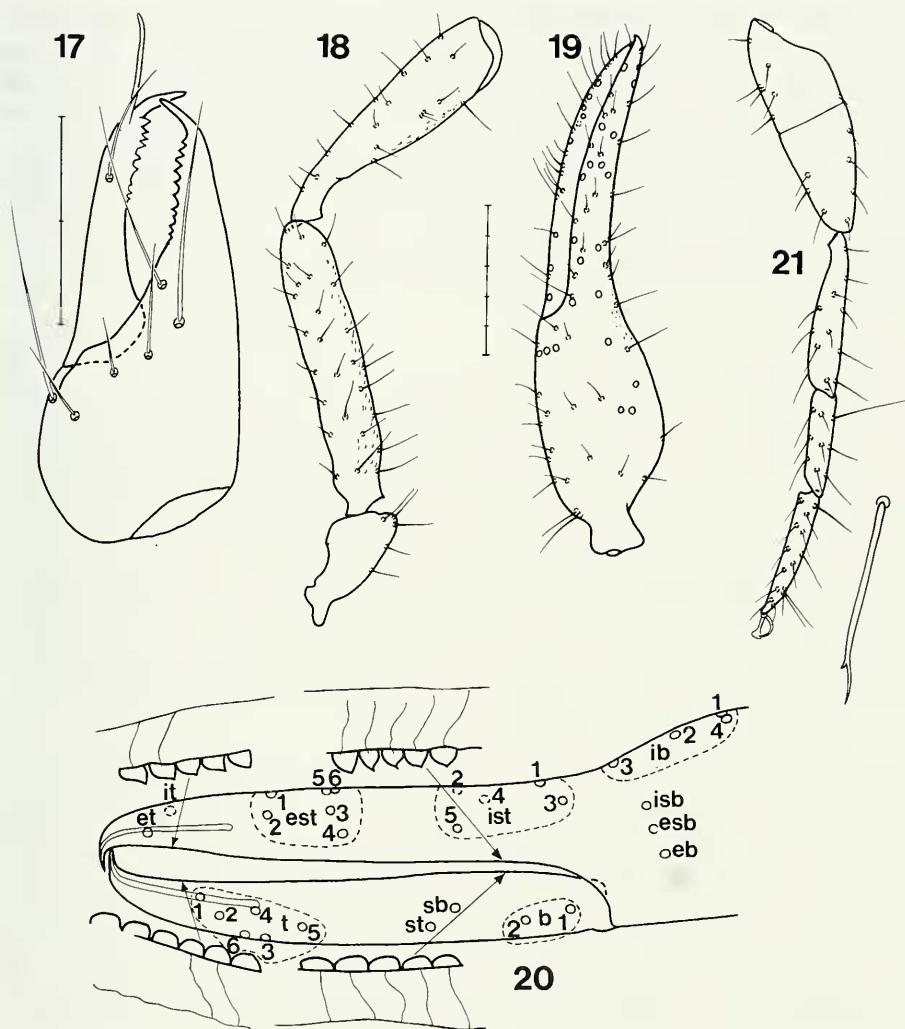
Description: Pedipalps yellowish-brown, carapace brown, tergites yellowish. Carapace 1.3 times as long as broad, laterally reticulate, granulate around eyes, anterior margin slightly protruding medially, well marked subbasal transverse furrow present; no eyes or eye-spots distinguishable, 23 setae (4-7-4-4-4); chaetotaxy of tergites: 4/6/7-8/8/8/8/8/8/9-10 (4 tactile setae)/10 (4 tactile setae). Apical lobe of palpal coxa 2 setae, palpal coxa granulate, 7-8 setae (1 tactile seta), I 5-6, II 5, III 4-5,

IV 5; anterior genital operculum with 6-7 medial setae (2 discal), sternite III 4, IV 5, 1 suprastigmal seta each, V-IX 8-9(10), X 9-11, XI 4-6; anal cone with 2 long dorsal and 2 shorter ventral setae. Chelicera (fig. 17): 5-6 setae on palm, both fingers with 9-12 teeth, serrula exterior with 26, serrula interior 16-18 blades, flagellum of 4 apically denticulate setae, galea long, smooth and slightly curved. Pedipalps (figs 18-20) slender, trochanter distally granulate, femur distinctly granulate, with a longer seta on dorsal side near base, 5.5-5.7 times as long as broad and 1.07-1.09 times longer than patella, which is 4.1 times, club of patella granulate, 3.1 times, hand finely granulate distally, with pedicel 2.0-2.1 times, chela with pedicel 4.2-4.5 times as long as broad, finger 1.18-1.19 times longer than hand with pedicel; fixed finger with 87 pointed teeth, movable one with 76-79 basally flattened teeth. 30 trichobothria (20+10). Leg I: femur 4.5-5.0 times as long as deep and 2.0 times longer than patella, which is 2.4-2.8 times, tibia 4.0 times (female from Alambari de Baixo 5.3 times), basitarsus 3.0 (4.4) times, telotarsus 5.1 (7.9) times as long as deep and 1.41 times longer than basitarsus; leg IV (fig. 21): femur+patella 3.0 (3.6) times, tibia 4.7 (5.3) times, basitarsus 4.1(4.4) times, with one tactile seta in basal third ($TS=0.20-0.23$), telotarsus 7.6 (7.8) times as long as deep and 1.25-1.29 times longer than basitarsus. Arolia as long as claws, which are slender and smooth; subterminal seta apically curved and dentate.

Measurements (in mm) (female from Alambari de Baixo in parentheses): Carapace 0.83/0.63 (0.90/0.63); Pedipalps: femur 0.98/0.18 (1.14/0.20), patella 0.90/0.22 (1.06/0.26), hand with pedicel 0.80/0.40 (0.95/0.44), chelal length 1.68 (1.98), finger length 0.95 (1.14); leg I: femur 0.50/0.11 (0.59/0.12), patella 0.25/0.10 (0.30/0.11), tibia 0.37/0.09 (0.44/0.06), basitarsus 0.25/0.08 (0.29/0.06), telotarsus 0.35/0.07 (0.41/0.05); leg IV: femur+patella 0.76/0.25 (0.85/0.23), tibia 0.53/0.11 (0.62/0.12), basitarsus 0.33/0.08 (0.38/0.07), telotarsus 0.43/0.06 (0.48/0.06).

Deutonymph: Carapace 1.4 times as long as broad (0.38/0.27mm), without eye-spots, 20 setae (6-4-4-2-4); tergites I/II 4 setae, III-IX 6, X/XI 8 (4 tactile setae each). Pedipalps smooth, femur 5.0 times as long as broad (0.49/0.10), patella 3.6 times (0.41/0.11), club 2.60 times as long as broad and 2.56 times longer than pedicel, hand with pedicel 1.9 times (0.35/0.19), chela with pedicel 4.5 times, length 0.85mm, finger 1.48 times longer than hand with pedicel, length 0.52mm; 15 trichobothria (9+6).

The female from the Gruta de Lacinhas probably belongs to this species, but due to certain teratological features it is not included in the type series. It differs from the type specimens mainly in the number and shape of the chelal teeth (less pointed, perhaps due to abrasion), the position of trichobothrium *sb* directly below *st*, and by the number of setae on the cheliceral palm (5). Fixed finger of chela with 69, movable finger with 66 teeth; 30 trichobothria (fig. 20) on right chela, 32 trichobothria (22+10: *esb*-territory with 2 supernumerary trichobothria) on left chela. Tarsi of leg I more slender: basitarsus 3.8 times as long as deep (0.23/0.06), telotarsus 6.5 times (0.33/0.05); those of leg IV stouter: basitarsus 3.5 times (0.30/0.09), telotarsus 6.5 times as long as deep (0.40/0.06). The female from Alambari de Baixo shows the same palpal proportions as the holotype, but is clearly larger and has more slender legs I and IV. Without information about the variability of these characters, I see no reason to exclude it from the type series.



FIGS 17-21

Ideoroncus cavicola sp. n. ♀; 17: chelicera; 18-19: pedipalp; 20: trichobothrial pattern on chelal hand; 21: leg IV, subterminal seta enlarged; scale unit 0.1mm.

Etymology: *cavicola* (lat.) = cave-dwelling

The number of trichobothria (normally 30), the absence of eyes or eye-spots, the shape of chelal teeth and their high number in this new species are characters shared only with *I. anophthalmus* Mahnert, described from the Serra da Cantareira (São Paulo). *Ideoroncus cavicola* sp. n. is easily distinguished from *anophthalmus*, mainly by the following characters: much more slender pedipalps (e.g. femur 5.5-5.7

vs 3.3 times longer than broad), larger size (femur length 0.98-1.14mm vs 0.64mm), and the higher number of teeth of the chelal fingers. Even if the reduction or absence of eyes cannot be considered, at least in this genus, as adpatation to cave life, other troglomorphic characters (such as slender pedipalps and its size) might classify this taxon as troglobitic species. Current knowledge of this genus has been summarized by Mahnert (1984). Variability in distribution of trichobothria within territories has already been noticed in *I. divisus* Mahnert and *auophthalnuus* Mahnert, but a printing error needs to be rectified: in *auophthalmus*, variability was observed in the *est-* territory, not, as indicated, in the *it*-territory (Mahnert, 1984: 665).

BOCHICIDAE

Spelaeobochica gen. n.

Diagnosis: A member of the family Bochicidae and the subfamily Bochicinae as outlined by Muchmore (1998). Clearly differing from all other genera by following characters. No eyes present, but two, tiny, latero-ventral tubercles present on each side. Chelicera with 9 setae on palm, flagellum of 4 dentate setae. Palps slender, chela 4.1 times longer than broad; femur with glandular(?) tubercle on lateral side near distal end; trichobothrium *ib* in distal half of dorsum of palpal hand; fingers longer than hand with pedicel; accessory teeth present on internal side of both palpal fingers; venom apparatus present in both fingers. Legs slender, femur+patella of leg IV 3.8 times longer than broad; arolia shorter than claws; subterminal seta weakly forked apically.

Terra typica: Brazil, Bahia State, in caves.

Type species: *Spelaeobochica alludentatus* sp. n.

Gender: male; Bochica was one of the most important deities of the Chibcha Indians of ancient Columbia (M. Judson, in litt.)

Affinities: The new genus seems to be quite isolated within the Bochicinae. It might be related to *Antillobisium* Dumitresco & Orghidan and *Troglobochica* Muchmore (similar in number of setae in flagellum, presence of a glandular(?) tubercle on palpal femur and a high number of setae on cheliceral palm), but it is readily distinguished by the distal position of trichobothrium *ib*, the presence of accessory teeth on the palpal fingers, the distal position of the glandular(?) tubercle on the palpal femur and by the shape of flagellar setae.

Spelaeobochica alludentatus sp. n.

Figs 22-29

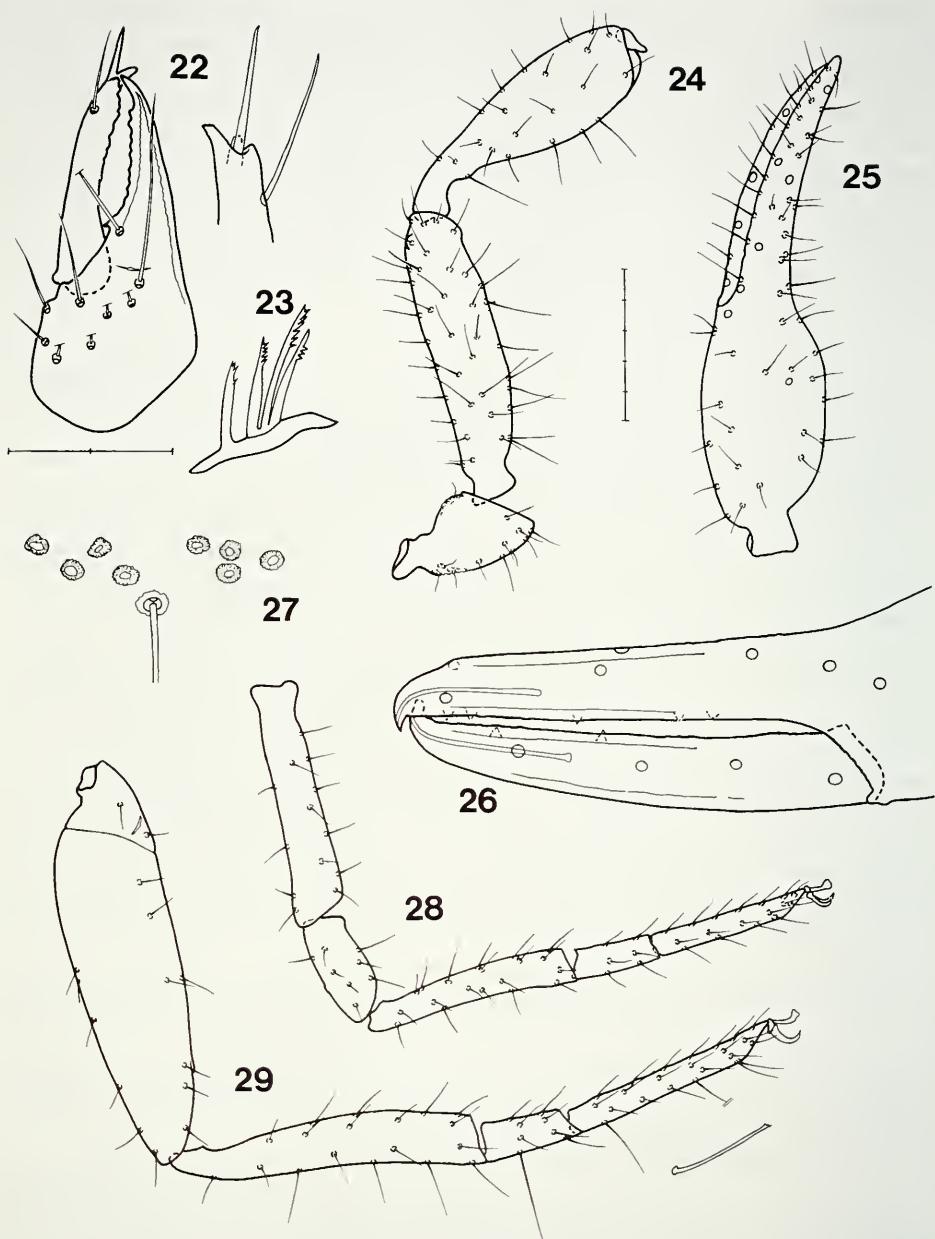
Material: Bahia, Gruta do Impossível, Palmeiras, lg. L. Senna Horta. 18.II.1996: 1♂ (holotype) 1♀ (paratype) (neither specimen well preserved, most setae have fallen off and the paratype lacks all the legs).

Description: Pedipalps, carapace, chelicerae, first coxae and first abdominal segments reddish, other parts yellowish. Tergites with more or less pronounced sclerotization along anterior margin. Vestiture setae delicate, smooth. Carapace 1.4 times longer than broad, anterior margin incurved medially, finely granulate antero-laterally, posterior half scaly-reticulate, a transverse furrow near posterior margin, no eyes, but with two, tiny, latero-ventral tubercles on each side, 6 setae on anterior and posterior margins. Chelicera (fig. 22): 9 acuminate setae on hand, each finger with 9 rounded

teeth, distal teeth of movable finger on distinct lamella, galea simple, serrula exterior 26, serrula interior 20 blades; flagellum (fig. 23) of 4 apically dentate setae; Tergites undivided, chaetotaxy: 5/6/9/11/11/13/12/13/14/16/? (probably 4 tactile setae); pleural membranes smoothly, longitudinally striate; manducatory process acute, with 2 apical setae of unequal length and two discal setae; palpal coxa scaly-reticulate, 10-11 setae, coxa I 9, II 6, III 6, IV 8 setae; genital operculum reticulate, about 13 marginal setae in the middle and about 7 discal setae, numerous tiny pores present; sternite III with 13 marginal setae and about 7 central discal setae, 2/3 setae at stigma, IV 7, 2 suprastigmal setae, remaining sternites 12/13/13/13/12/12/about 10 (probably 6 tactile setae); with round glandular(?) organs, their number increasing from 4 (anterior sternites) to about 20 (sternite XI) (see fig. 27), anal cone with 2 pairs of setae. Genital organ of male: one smooth, short seta on each side of posterior genital plate; lateral genital sacs relatively short and of *Neobisium*-type; numerous glandular ducts opening into atrium of posterior dorsal gland; genital glands(?) well developed, grape-like. Pedipalps (figs 24-25): trochanter finely granulate basally, a rounded dorsal hump present; femur smooth, 4.2 times as long as broad, with a lateral glandular(?) hump near distal end, patella smooth, with a small protuberance at distal end of pedicel, 3.3 times, hand smooth, with pedicel 2.1 times, chela with pedicel 4.1 times longer than broad, finger 1.1 times longer than hand with pedicel; trichobothria (fig. 26): *ib* in distal half of hand dorsum, *ist* slightly proximal of *est*, *it* nearly at same level as *et*; *b-sb-st-t* nearly equidistant. Fixed finger with 69, movable finger with 77 small, contiguous, cusped teeth (basal ones broader), fixed finger on internal side with 5, movable finger with 2 accessory teeth; venom apparatus well developed in both fingers. Legs rather slender: leg I (fig. 28): femur 4.4 times longer than deep and 2.1 times longer than patella, patella 2.2 times, tibia 5.9 times, basitarsus 2.9 times, telotarsus 6.5 times longer than deep and 1.9 times longer than basitarsus; leg IV (fig. 29): femur+patella 3.8 times, tibia 6.3 times, basitarsus 2.6 times, telotarsus 7.9 times longer than deep and 2.2 times longer than basitarsus; both with a basal tactile seta (TS= 0.34 and 0.15, respectively); subterminal seta weakly forked apically, arolia undivided, shorter than smooth claws.

Measurements (in mm): Carapace 0.85/0.60 (holotype) (0.88/0.72) (paratype); Palps: femur 0.95/0.23 (0.97/0.23), patella 0.90/0.28 (0.92/0.27), hand with pedicel 0.83/0.40 (0.84/0.40), finger length 0.89 (0.92), chela length (with pedicel) 1.65 (1.70); Leg I: femur 0.44/0.10, patella 0.21/0.10, tibia 0.41/0.07, basitarsus 0.16/0.05, telotarsus 0.30/0.05; leg IV: femur+patella 0.77/0.20, tibia 0.60/0.07, basitarsus 0.19/0.07, telotarsus 0.42/0.05.

The surprising finding of this bochicin genus extends the range of the family far to the south of the South American continent; the previously known range of the cavernicolous and epigean genera and species extended from Texas and Mexico to Central America, from the Antilles to Guyana and Venezuela (Muchmore, 1998); members of the Bochicinae (as defined by Muchmore, 1998) are only known from Mexico and Central America, Cuba, Jamaica and the Lesser Antilles, one unidentified species of the genus *Bochica* has been recorded by Heurtault (1994) from a cave of Venezuela (M. Judson, in litt.).



FIGS 22-29

Spelaeobochica allobidentatus gen. n.sp. n. ♂; 22: chelicera, with apical end of movable finger enlarged, lateral view; 23: flagellum; 24-26: pedipalp; 27: glandular(?) openings on sternite XI; 28-29: leg I and IV (with enlarged subterminal seta); scale unit 0.1mm.

Etymology: *allodentatus* (lat.), refers to presence of accessory teeth on chelal finger.

OLPIIDAE

Progarypus nigrimanus sp. n.

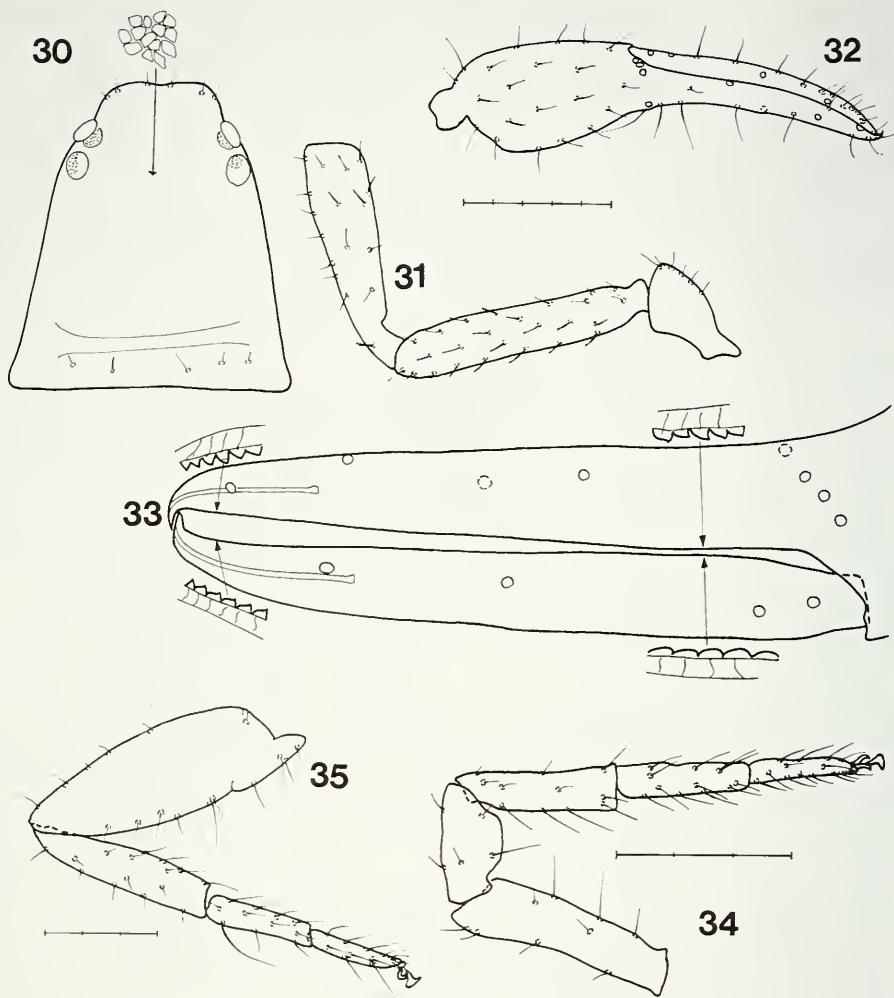
Figs 30-35

Progarypus sp. (116); Pinto-da-Rocha, 1995: 85 (SP-41).

Material: São Paulo, Caverna Santana, Iporanga, lg. E. Trajano: 28.XI.1988: 1♀ (holotype) (MZUSP 10294); same cave, lg. E. Trajano & P. Gaspini, 8.VIII.1990: 1♀ (paratype) (MZUSP 13821).

Description: Carapace (fig.30) brown, anterior tergites yellowish-brown, posterior ones darker, pedipalps yellowish-brown, chela darker brown. Carapace triangular, 1.1-1.2 times as long as broad, anteriorly with squamose sculpturing, posteriorly reticulate, cucullus short, with an indistinct longitudinal furrow, distinct subbasal transverse furrow present; 4 large eyes; 4 setae on anterior margin, one preocular seta on each side, 4-5 setae on posterior margin (the lateral ones very short); tergites reticulate, normally with 6 (7) setae, X with 4 longer setae, XI with 4 tactile setae; apical lobe of palpal coxa with 2 marginal and 3 discal setae, palpal coxa laterally scaly, ca 23-28 setae (2 tactile), coxa I 15-19 (1 tactile seta), II 16-19 (1 TS), III 19-20, IV 22-27; anterior genital operculum medially with 5-6 marginal and 5 discal setae, sternites III/IV with 6 setae, IV with 0-1 suprastigmal seta on each side, V/VI 9-10, VII 12, VIII 10, IX 10, X 11 (2 submedial tactile setae), XI probably 2; anal cone with 0/2 setae; tracheal tubes normal, not widened. Chelicera: palm with 5 setae, fixed finger with 3 large and 2 small, subapical teeth, movable finger with tooth-like subapical lobe, galea long, with 3 apical branches, serrula exterior 18 blades, flagellum with 3 setae (first one long and thick). Pedipalps (figs 31-32): Trochanter granulate, femur scaly dorsally, 4.7-5.3 times as long as broad and 1.08-1.10 times longer than patella, which is 3.8-3.9 times as long as broad, club 3.1 times as long as broad and 3.32-3.91 times as long as pedicel, hand with pedicel 1.8-2.0 times, chela with pedicel 4.0-4.4 times as long as broad, finger 1.23-1.29 times longer than hand with pedicel; fixed finger with 70-72 pointed teeth, movable finger with 51-53 teeth, flattened in proximal half of finger. Trichobothria (fig. 33): *est* half-way between *isb* and *it*, much nearer to *ist* than to *isb* and proximal to *st*; *st* slightly nearer to *t* than to *sb*. Leg I (fig. 34): femur 3.6 times as long as deep and 1.86 times longer than patella, which is 2.0-2.1 times as long as deep, tibia 3.7-4.1 times, basitarsus 3.5-4.1 times, telotarsus 4.3-4.6 times as long as deep; leg IV (fig. 35): femur+patella 2.9-3.0 times, tibia 4.0-4.9 times, basitarsus with basal tactile seta (TS=0.16), 3.9-4.1 times as long as deep and 1.19-1.22 times longer than telotarsus, which is 4.8 times as long as deep; subterminal seta smooth, arolia undivided and longer than claws.

Measurements (in mm): Carapace 0.77-0.79/0.65-0.70; Pedipalps: femur 0.86/0.17-0.18, patella 0.78-0.79/0.20, hand with pedicel 0.68-0.71/0.34-0.38, finger length 0.87-0.89, chelal length 1.50-1.51; leg I: femur 0.39/0.11, patella 0.21/0.10-0.11, tibia 0.28-0.30/0.07-0.08, basitarsus 0.21-0.22/0.05-0.06, telotarsus 0.18/0.04; leg IV: femur+patella 0.71-0.75/0.24-0.26, tibia 0.50/0.10-0.13, basitarsus 0.28/0.07, telotarsus 0.23-0.24/0.05.



FIGS 30-35

Progarypus nigrimanus sp. n. ♀; 30: carapace; 31-33: pedipalps; 34: leg I; 35: leg IV (femur+patella without complete suture); scale unit 0.1mm.

Etymology: *nigrimanus* (lat.) refers to the dark coloured chelal hand.

Progarypus setifer sp. n.

Figs 36-40

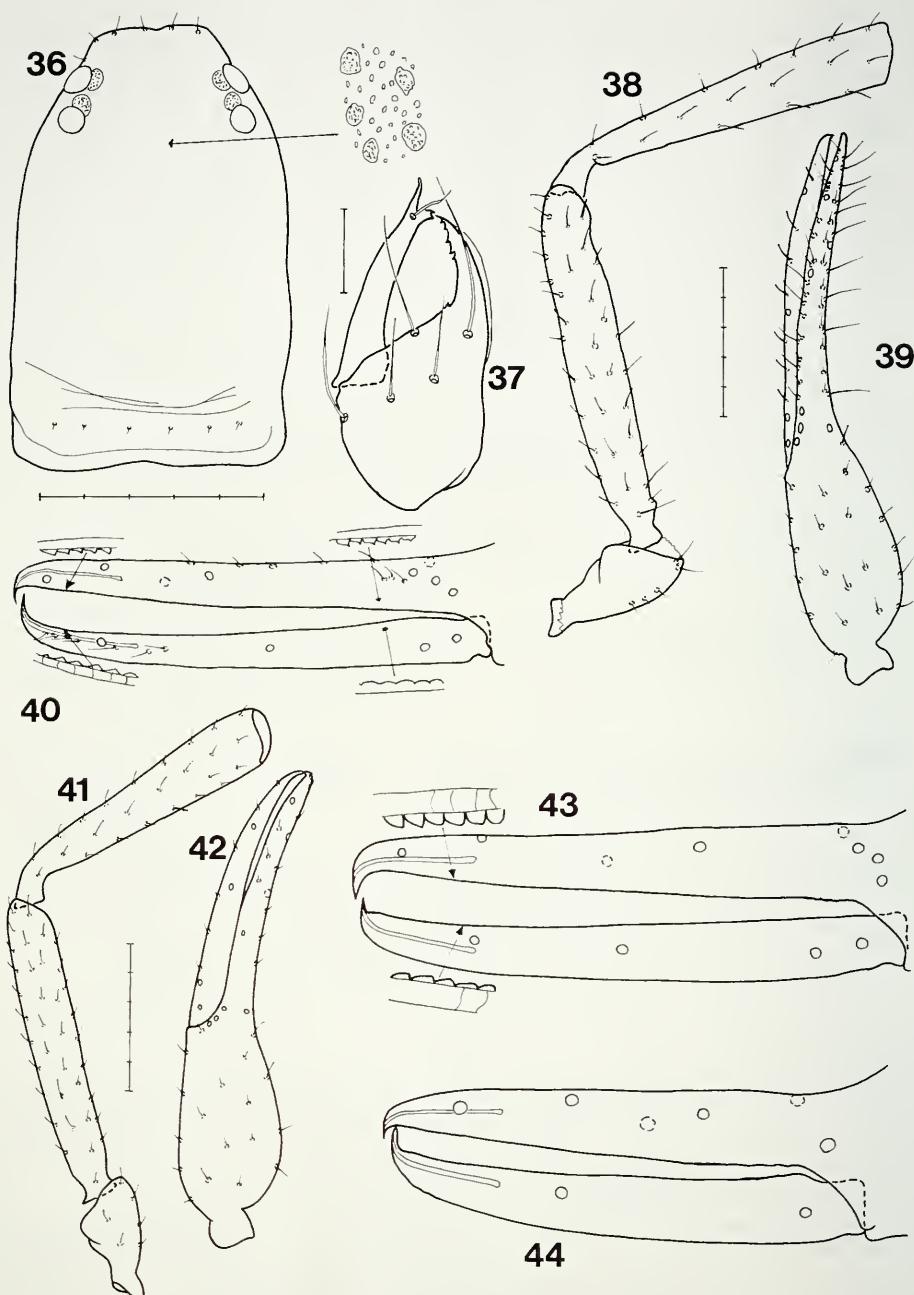
Progarypus sp. (116); Pinto-da-Rocha, 1995: 85 (MG-123, MG-199).

Material: Minas Gerais. Gruta do Janelão. Itacarambi, lg. P. Palacios-Vargas, 19.VII. 1988: 1♂ (holotype) (MZUSP 10289); Lapa dos Desenhos, Itacarambi, lg. E. Trajano, 8.VII. 1993: 1♀ (MZUSP 13845) (paratype).

Description: Carapace and pedipalps reddish-brown, tergites/sternites yellowish, carapace densely granulate: between the numerous larger granula is a clearly granulate microsculpture (appearance like ostrich leather), a short cucullus and 4 large eyes present, anterior eyes slightly larger than posterior pair, carapace (fig. 36) 1.6 times as long as broad, parallel-sided, 2-4 + 2 preocular setae on anterior margin, 5-6 on posterior one, setae small and indistinct; tergite I 4, II 5-6, III-VIII 6; IX 8 (2 sublateral tactile setae), X 8 (4 tactile setae), XI 10 (4 tactile setae); apical lobe of palpal coxa 2 marginal and 3 discal setae, palpal coxa granulate (like carapace), about 16 setae (2 tactile), coxa I 10-11, II-III 9-13, IV about 9 (male)/20 (female) (setae small, indistinct); anterior genital operculum of male with 10 marginal and 6 anterior discal setae, entrance of genital chamber with 2/2 setae, anterior genital operculum of female with 4 medial setae, sternite III/IV 9, V-IX 8-9, X 6 (2 tactile setae), IX 3; anal cone with 2/2 setae. Chelicera (fig. 37): palm with 5 setae, movable finger with slightly bilobed subapical lobe, galea with 3 apical branches, serrula exterior 18 blades, flagellum 3 setae. Pedipalps (figs 38-39): trochanter with distinct dorsal hump, coarsely granulate, femur and patella coarsely granulate, femur 6.2 times (female 4.9) as long as broad, with a short dorsal 'tactile' seta near base, patella 6.3 (4.5) times, club 5.4 (3.76) times as long as broad and 6.1 (4.87) times longer than pedicel, hand nearly smooth, with a few tiny granula near finger base, with pedicel 2.2 (1.7) times, chela with pedicel 5.4 (3.7) times as long as broad, finger 1.47 (1.27) times longer than hand with pedicel; fixed finger with 51 (39!) pointed teeth, movable finger with 39 (32) teeth (pointed only in distal fourth of finger), on fixed chelal finger two rows (one dorsal, one external) of short pinlike setae. Trichobothria (fig. 40): *eb-esb-ib-ish* at finger base, *ist-est-it-et* in distal half and distal to *st*; *ist* nearly halfway between *it* and *est*; *st* halfway between *sb* and *t*. Leg I: femur 4.7 (female 3.9) times as long as deep and 1.89 (1.87) times longer than patella, which is 2.6 (2.3) times, tibia 6.6 (5.2) times, basitarsus 5.7 (5.0) times as long as deep and 1.56 (1.40) times longer than telotarsus, which is 4.4 (5.0) times as long as deep; leg IV: femur+patella 2.8 (female 2.7) times, tibia 5.5 (4.8) times, basitarsus with a short tactile seta near its base, 5.4 (4.4) times as long as deep and 1.30 (1.21) times longer than telotarsus, which is 6.3 (5.7) times as long as deep; subterminal seta smooth, arolia undivided and longer than claws.

Measurements (in mm) of male (female): carapace 0.93/0.57 (0.95/0.61); pedipalps: femur 1.21/0.19 (1.11/0.23), patella 1.23/0.20 (1.05/0.23), hand with pedicel 0.75/0.34 (0.80/0.46), finger length 1.10 (0.98), chelal length 1.80 (1.72); leg I: femur 0.55/0.12 (0.47/0.12), patella 0.29/0.11 (0.25/0.11), tibia 0.48/0.07 (0.40/0.08), basitarsus 0.35/0.06 (0.28/0.06), telotarsus 0.22/0.05 (0.20/0.04); leg IV: femur+patella 0.88/0.31 (0.83/0.30), tibia 0.68/0.12 (0.62/0.13), basitarsus 0.41/0.08 (0.35/0.08), telotarsus 0.31/0.05 (0.29/0.05).

Etymology: *setifer* (lat.), refers to the presence two rows of pin-like setae on fixed chelal finger.



Figs 36-44; 36-40: *Progarypus setifer* sp. n. ♂; 36: carapace, microsculpture enlarged; 37: chelicera; 38-40: pedipalp; 41-44: *Progarypus gracilis* sp. n. ♀; 41-42: pedipalp; 43: trichobothrial pattern; 44: deutonymph, trichobothrial pattern; scale unit 0.1mm.

Progarypus gracilis sp. n.

Figs 41-44

Material: Minas Gerais, Gruta Periperi I, Matozinhos, Ig. L.S. Horta, 15.I.1993: 1♀ (holotype) (MZUSP 13832); Gruta do Labirinto Fechado, Lagoa Santa, Ig. L.S. Horta, 24.IX.1995: 1♂ 1♀ 1D; Gruta da Lapinha, Lagoa Santa, Ig. L.S. Horta, 18.VII.1995: 2♂ 1♀ 1D; Gruta do Bari, Pedro Leopoldo, Ig. L.S. Horta, 19.VII.1997: 1♂ (paratypes).

Description: Carapace olive, pedipalps yellowish-brown, tergites/sternites yellowish, carapace densely granulate; between the numerous larger granula is a clearly granulate microsculpture (appearance like ostrich leather), basal part (including subbasal furrow) clearly reticulate, a short cucullus and 4 large eyes present, anterior eyes slightly larger than posterior pair, carapace 1.5-1.7 times as long as broad, parallel-sided, 4 + 2 preocular setae on anterior margin, 4-6 on posterior one, setae small and indistinct; tergite I 5-6, II-IX 6 (7-8), IX 2 sublateral tactile setae, X 2 tactile setae, XI 2 lateral tactile setae; apical lobe of palpal coxa with 3 marginal and 1 discal setae, palpal coxa scaly (points of 'scales' forming granula), about 30 setae (2 tactile), coxa I 12-14, II 14-15, III 12-14, IV 15-17 (setae small, indistinct); anterior genital operculum with 6-8 medial setae (female) or 9 marginal and 6 discal setae (male), sternite III/IV 6-8, V-VIII 10-12, IX 9 (2 tactile setae), X 8, XI 4 (2 tactile setae); anal cone with 2/2 setae. Chelicera: palm with 5 setae, movable finger with broad, triangular subapical lobe, galea with 3 apical branches, serrula exterior 20 blades, flagellum 3 setae. Pedipalps (figs 41-42): trochanter with distinct dorsal hump, coarsely granulate, femur and patella coarsely granulate, femur 5.5-6.0 times as long as broad, patella 4.9-5.3 times, club 4.0-4.5 times as long as broad and 4.4-5.2 times longer than pedicel, hand smooth, with pedicel 2.0-2.3 times, chela with pedicel 4.3-5.0 times as long as broad, finger 1.2-1.3 times longer than hand with pedicel; fixed finger with a series of short pin-like setae, with 61-67 pointed teeth, movable finger with 43-51 teeth (pointed only in distal fourth of finger). Trichobothria (fig. 43): *eb-esb-ib-isb* at finger base, *ist* at same level as *st*, only *it/et* clearly distal to *st*; *ist* nearer to *it* than to *est*; *st* slightly nearer to *t* than to *sb*. Leg I: femur 4.3-4.4 times as long as deep and 2.0 times longer than patella, which is 2.2-2.3 times, tibia 4.7-5.3 times, basitarsus 4.5-4.8 times as long as deep and 1.3-1.4 times longer than telotarsus, which is 5.0-5.4 times as long as deep; leg IV: femur+patella 2.7-3.0 times, tibia 4.9-5.0 times, basitarsus with a short tactile seta near base, chaetotaxy: 'tactile seta'+3/4/4, 4.3-4.6 times as long as deep and 1.25-1.35 times longer than telotarsus, which is 5.0-5.2 times as long deep; subterminal seta smooth, arolia undivided and longer than claws.

Measurements (in mm): Carapace 0.83-0.92/0.52-0.57; pedipalps: femur 0.86-1.01/0.14-0.17, patella 0.85-1.00/0.17-0.19, hand with pedicel 0.60-0.73/0.28-0.34, finger length 0.81-0.91, chelal length 1.37-1.60; leg I (1♂ 2♀): femur 0.43-0.45/0.10, patella 0.21-0.23/0.10, tibia 0.36/0.07, basitarsus 0.25-0.26/0.04-0.06, telotarsus 0.19-0.20/0.03-0.04; leg IV: femur+patella 0.80/0.26-0.30, tibia 0.55-0.59/0.11-0.12, basitarsus 0.31-0.32/0.07, telotarsus 0.24-0.25/0.05.

Etymology: *gracilis* (lat.) refers to the slender, elongate palpal segments.

Progarypus liliae sp. n.

Figs 45-47

Material: Bahia, Gruta dos Brejões, Morro do Chapéu, Ig. Lilia S. Horta, 7.IX.1994: 1♀ (holotype).

Description: Carapace chocolate brown, pedipalps yellowish-brown, tergites/sternites yellowish, carapace smooth, a short cucullus and 4 large eyes present, anterior eyes slightly larger than posterior pair, carapace 1.6 times as long as broad, parallel-sided, 4 + 2 preocular setae on anterior margin, 4 on posterior, setae small and indistinct; tergite I 4, II-IX 6-8, XI 2 lateral tactile setae; apical lobe of palpal coxa with 3 marginal and 1 discal setae, palpal coxa smooth, about 18 setae (2 tactile), coxa I 11, II 10, III 9, IV 16 (setae small, indistinct); anterior genital operculum with 8 medial setae, sternite III/IV 6-8, V-VII 6-8, VIII-X 9 (2 tactile setae), XI 4 (2 tactile setae); anal cone with 2/2 setae. Chelicera: palm with 5 setae, movable finger with broad triangular subapical lobe, galea with 3 apical branches, serrula exterior 18 blades, flagellum 3 setae. Pedipalps (figs 45-46): trochanter with distinct dorsal hump, femur and patella smooth (some tiny isolated granules perceptible), femur 5.7 times as long as broad, patella 4.7 times, club 3.8 times as long as broad and 4.5 times longer than pedicel, hand smooth, with pedicel 2.2 times, chela with pedicel 4.8 times as long as broad, finger 1.3 times longer than hand with pedicel; fixed finger with 72 pointed teeth, movable finger with 46 teeth (pointed only in distal fourth of finger). Trichobothria (fig. 47): eb-esb-ib-ib at finger base. ist slightly distad st, only it/et clearly distal to st; ist close to est; st nearer to t than to sb. Leg I: femur 5.2 times as long as deep and 2.2 times longer than patella, which is 2.4 times, tibia 6.5 times, basitarsus 6.1 times as long as deep and 1.3 times longer than telofemur, which is 7.3 times as long as broad; leg IV: femur+patella 3.2 times, tibia 5.5 times, basitarsus with a short tactile seta near its base, 5.9 times as long as deep and 1.2 times longer than telotarsus, which is 7.7 times as long as deep; subterminal seta smooth, arolia undivided and longer than claws.

Measurements (in mm): Carapace 0.93/0.58; pedipalps: femur 1.12/0.19, patella 1.06/0.12, hand with pedicel 0.85/0.38, finger length 1.13, chelal 1.85; leg I: femur 0.53/0.10, patella 0.24/0.10, tibia 0.44/0.07, basitarsus 0.31/0.05, telotarsus 0.23/0.03; leg IV: femur+patella 0.90/0.29, tibia 0.66/0.12, basitarsus 0.40/0.07, telotarsus 0.34/0.04.

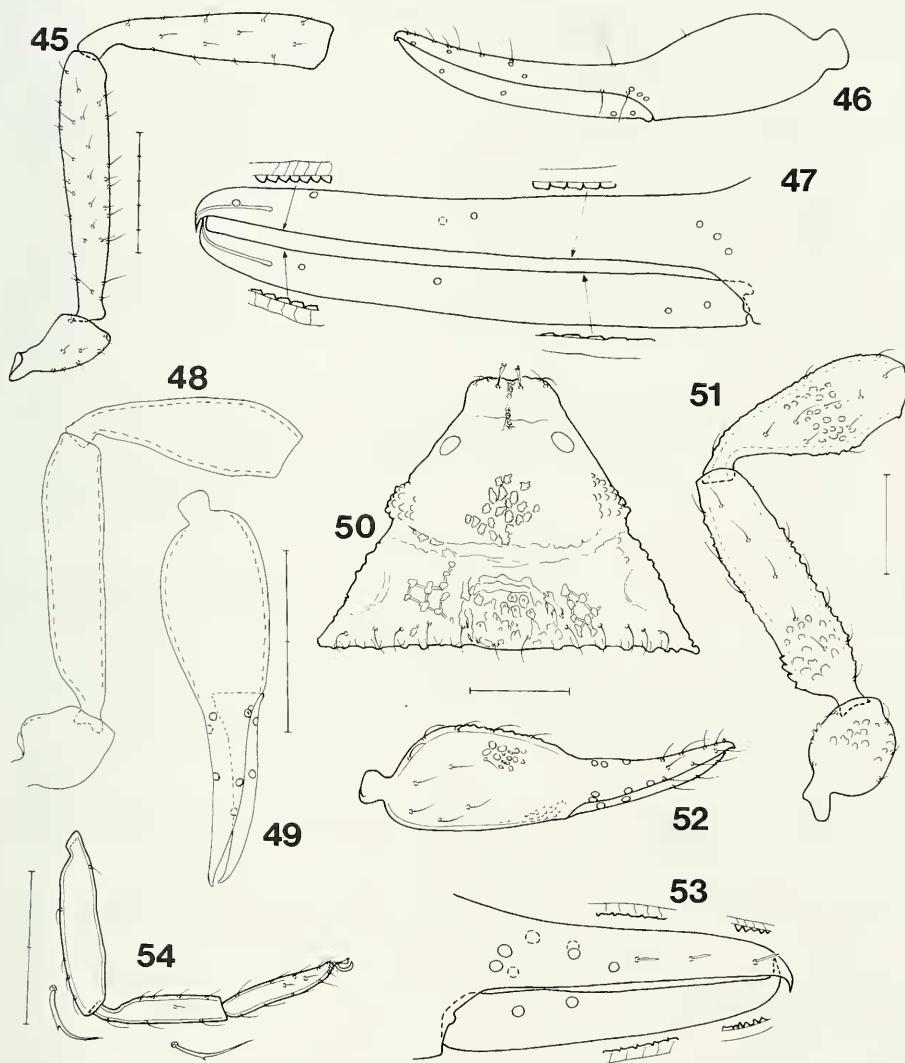
Etymology: named in honour of Miss Lilia Senna Horta, collector of many pseudoscorpions in Bahia caves.

Progarypus sp.

Progarypus sp. (116); Pinto-da-Rocha, 1995: 85 (MG-32).

Material: Minas Gerais, Gruta Bonita, Januária, Ig. E. Trajano, 8.VII.1993: 1T.

This tritonymph cannot be assigned to one of the known species. It is characterized by: carapace, palpal femur and patella finely granulate, femur baso-dorsally with a tactile seta, hand smooth; palpal femur 5.2 times longer as broad (0.68/0.13mm), patella 4.4 times (0.58/0.13), hand with pedicel 1.9 times (0.48/0.26), finger length 0.64mm, chela with pedicel 4.2 times longer than broad (length 1.07mm).



FIGS 45-54

45-47: *Progarypus liliae* sp. n. ♀; 45-46: pedipalp; 47: trichobothrial pattern; 48-49: *Cheiridium itapemirinense* (Feio) ♂, pedipalp; 50-54: *Cheiridium brasiliense* sp. n. ♂; 50: carapace; 51-53: pedipalp; 54: leg IV; scale unit 0.1mm.

KEY TO *PROGARYPUS* SPECIES RECORDED FROM BRAZIL

- 1 Large species, palpal femur length 1.11mm (female) to 1.21mm (male); trichobothria *ist-est-it-et* in distal finger half, distal to *st*; finger 1.5 times longer than chelal hand with pedicel; movable chelal finger with 32-39 teeth *P. setifer* sp. n.
- 1° Smaller species, palpal femur length 0.7-1.0 mm; at least one of trichobothria *est-ist-it-et* proximal to *st*; finger relatively shorter, at most 1.3 times longer than chelal hand with pedicel 2
- 2 Finger shorter than hand with pedicel; trichobothria *ist* and *est* apparently proximal to *st*; palpal femur 4.6 times (length 0.73mm), patella 3.5 times (length 0.70) longer than broad *P. novus* Beier
- 2° Finger 1.2 to 1.3 times longer than chelal hand; only trichobothrium *est* proximal to *st* 3
- 3 Pedipalps bicoloured, chelal hand darker than femur and patella; palpal femur 4.7-5.3 times (length 0.86mm), patella 3.8-3.9 times (length 0.78-0.79mm) longer than broad; carapace anteriorly with "paving-stone" sculpture *P. nigrimanus* sp. n.
- 3° Pedipalps unicolourous, hand not darker than femur and patella 4
- 4 Pedipalps and carapace granulate; palpal femur 5.5-6 times longer than broad (length 1.01mm), patella 4.9-5.4 times (length 0.85-1.02mm); carapace anteriorly granulate, with clear microsculpture between granula; telotarsus IV 5.0-5.2 times longer than broad *P. gracilis* sp. n.
- 4* Pedipalps and carapace smooth; palpal femur 5.8 times longer than broad (length 1.12mm), patella 4.7 times (length 1.06mm), telotarsus IV 7.7 times longer than broad *P. liliae* sp. n.

The seven previously known species of this genus were recorded in Brazil (1), Chile (2), Colombia (1), Paraguay (2) and Peru (1), all from edaphic localities. The only species previously known from Brazil (*novus* Beier, from Bahia) is not represented in this collection, and the presence of four new species suggests that the genus is widespread in South America south of the Amazon basin and more specious than might have been supposed from earlier data. None of the new species shows any adaptation to permanent cave life.

CHEIRIDIIDAE

Cheiridium itapemirinense (Feio) comb. nov.

Figs 48-49

Geogarypus itapemirinensis Feio, 1941: 241, one unnumbered fig.

Material: Espírito Santo, Cachoeira do Itapemirim, Ig. R. Gomes de Moraes: 2 ♂ (paratypes) (2 slides, MN RJ 10402).

Short description: Carapace triangular (form generally as in *brasiliense* sp. n.), with 2 corneate eyes; somewhat flattened and broken longitudinally, surface granulate-reticulate; tergites divided, tergite XI visible dorsally, 8 to 10 setae on anterior half-

tergites, sculpturing as on carapace; cheliceral palm with 4 setae, serrula exterior 9 blades, flagellum of 3(?) (left chelicera of 1 specimen) or 4 (right chelicera) blades. Pedipalps (figs 48-49): femur 4.8 times longer than broad (0.31-0.32/0.06-0.07mm), patella 3.2 times (0.24-0.26/0.08), chelal hand 2.1 times (0.24/0.11: 1♂), finger length (1♂) 0.21mm, chela with pedicel 3.8 times (0.43/0.11) (2♂: 4.1 times, 0.41/0.10); teeth not visible. Trichobothria: 7 on fixed, 2 on movable finger, *b* clearly nearer to finger base than to *t*. Leg IV (one ♂): femur+patella 4.8 times (0.26/0.05), tibia 5.1 times (0.20/0.04), tarsus 6.1 times (0.18/0.03) longer than deep.

There is little doubt about the generic assessment of this epigean species. Kury & Nogueira (1999) mention one female paratype from the Rio de Janeiro collection, but I received on loan two slides, each with one mounted male specimen (on one slide the cleared specimen is difficult to observe). Feio (1941) described the male holotype and two paratypes without indicating their sex. Within the Neotropical fauna, it resembles in size and morphometric values *C. chamberlini* Dumitresco & Orgidan from two caves in Cuba, but can be distinguished by the position of trichobothrium *b* of movable chelal finger being much closer to finger base than to *t*; in *chamberlini* the basal trichobothrium (labelled as *st* by Dumitresco & Orgidan, 1981: fig. 3 E) is nearer to *t* than to the finger base.

Cheiridium brasiliense sp. n.

Figs 50-54

Material: Bahia, Gruta dos Cristais I, Morro do Chapéu, "em guano do mercego frugívoro", Ig. L. S. Horta, 10.IX.1994: 1♂ (holotype) 1♂ (paratype).

Description: All parts light brown; carapace (fig. 50) 0.75 times as long as broad, 2 corneate eyes; surface granulate (slightly star-like) anterior to transverse furrow, granulate-reticulate behind; a small lateral hump on each side anterior to transverse furrow; a shallow granulate depression near posterior margin, which is ornamented (as well as those of the tergites I-VII) with small but prominent granulae; setae curved, slender, with one tiny tooth, 4-5 (the two inner ones clavate) at anterior and 11-12 at posterior margin. All tergites but the last divided, chaetotaxy of half-tergites: I/II 7-8, III-VIII 9-10, IX 7, X 4, XI 4 (whole), lateral setae on IV-X. Apical lobe of palpal coxa with 2 marginal and one discal setae, palpal coxa 6 setae, coxa I/II 5, III 6-7, IV undivided, with grooved anterior margin, posterior corner enlarged; anterior genital operculum with about 24-26 setae, half-tergites with about 6-8 smooth setae plus a dentate lateral seta. Cheliceral palm with 4 smooth setae, 3 teeth on fixed finger, one large subapical tooth on movable finger; galea smooth, serrula exterior 10 lamellae, flagellum of 4 setae.

Pedipalps (figs 51-52) rather slender, granulate, femur fairly abruptly enlarged, 3.9-4.1 times, patella 2.7-2.8 times, club 2.2 times longer than broad and 4.0-4.5 times longer than pedicel, hand with pedicel 1.9-2.0 times longer than broad and 1.2 times longer than finger, chela with pedicel 3.4-3.65 times, fixed finger with 17-18 teeth (proximad *est*), movable finger with 16 teeth reaching to *t*. Trichobothrial pattern as in fig. 53, 7 trichobothria on fixed finger, 2 on movable finger. Legs: no articulation visible between femur and patella of legs; leg IV (fig. 54): femur+patella 4.4-4.6 times,

tibia 4.9-5.1 times, tarsus 5.5-6.1 times longer than deep, arolia undivided and as long as the smooth claws.

Measurements: Carapace 0.28-0.30/0.38-0.40; palps: femur 0.27-0.28/0.07, patella 0.23-0.24/0.08-0.09, hand 0.21/0.10-0.11, finger length 0.17-0.18, chelal length 0.37-0.38; leg IV: femur+patella 0.24-0.25/0.05-0.06, tibia 0.18-0.19/0.04, tarsus 0.15-0.17/0.03.

Discussion: Five species of this genus are currently recorded from the Neotropical region: *itapenirinense* (Feio) from Brazil, *andinum* Vitali-di Castri and *dancouai* Vitali-di Castri from Chile, *chamberliui* Dumitresco & Orgidan from caves in Cuba and *insulare* Vitali-di Castri from Guadeloupe. The new species seems to be quite near to *itapenirinense* concerning the main characters, but differs in having slightly stouter pedipalps (femur 3.9-4.1 vs 4.8; patella 2.7-2.8 vs 3.2) and slightly smaller size (palpal femur 0.27-0.28mm vs. 0.30-0.32mm), furthermore the shape of femur is quite different possessing a slight lateral hump near its base; it differs from *dancouai* by the more slender pedipalps (3.9-4.1 vs 3.2-3.4 times) and the presence of granula at the posterior border of the carapace and anterior tergites. *Ch. chamberlini* (from Cueva de Cativar, Cuba) is larger (palpal femur length 0.32mm), with more slender pedipalps (femur 4.6 times). The North American species *reyesi* Muchmore, from Cot Cave, Texas, is also larger, with a more slender palpal femur, but a much stouter chela (without pedicel) (2.85 vs. 3.4 times). The widely distributed species *Ch. nuseorum* (Leach) clearly differs from the new species in the shape and measurements of the pedipalps. Within the genus *Cryptocheiridium* the species *brasiliense* n.sp. seems to be quite similar to *lucifugum* Beier from the Batu Caves (Malaya) but this latter species has even more slender pedipalps (femur of male 4.7 times, length 0.42mm) and is much bigger.

In spite of the fact that the new species has four blades in the flagellum and that also tergite XI is visible, it is placed in the genus *Cheiridium*, and not in the genus *Cryptocheiridium*, mainly because of the shape of the pedipalps, the absence of clear "spines" on the borders of carapace and anterior tergites, and the morphology of the vestiture setae (absence of exudate). It is questionable whether the number of flagellar blades (3 in *nuseorum*, 4 in *subtropicum*, the respective type species) (Judson, 1992; in litt.) can be considered a reliable generic character. In at least two East African species (*perreti* Mahnert and *tumidum* Mahnert from Kenya), 3 or 4 blades have been counted (Mahnert, 1982), and other species placed in *Cheiridium*, such as *Cheiridium chamberliui* from Cuba (Dumitresco & Orgidan, 1981), possess 4 blades in the flagellum. Differences in the number of trichobothria on the chelal finger (8 or 9) are considered to be of generic (Schawaller, 1981) or specific (Callaini, 1985) value, but may simply be due to erroneous observations (e.g. Beier, 1955 for *Cryptocheiridium elongense*).

CHERNETIDAE

Spelaeochernes gen. n.

Diagnosis: A genus of the family Chernetidae. All parts fairly heavily sclerotized; carapace with two distinct transverse furrows, more or less granulate; without a

central modification (« keel ») at posterior margin ; normally two faint eye-spots present, setae clavodentate; tergites and sternites divided (except XI), last tergite with 2 lateral tactile setae, last sternite with 4 tactile setae; anal cone 2+2 smooth setae; anterior genital operculum of male with about 10 long acuminate setae, surrounded by about 40 shorter ones, that of female with about 25 biserially arranged setae; spermatheca of female with two very short sacs, united at their base; palm of chelicera with 5-7 setae, of which 1-3 are usually finely dentate; galea long, slender, with 6 or more rami, flagellum of 4 blades (one or more dentate). Pedipalps: male chelal hand of some species with an internal, more or less pronounced, setiferous protuberance at finger base, but other species with normal shape, as in female; external and internal accessory teeth present on both chelal fingers; long seta near *ist* absent; trichobothrium *ist* nearly at same level as *est*, *it* nearly at same level as *et*; *st* slightly nearer to *t* than to *sb*; venom apparatus well developed in movable finger, a very small venom duct present in fixed finger; a small number of sense-spots present between *esb* and *est*, and distad *sb*. Legs slender, femur+patella of leg IV at least 3.7 times, tibia at least 5.5 times, tarsus 6.0 times as long as deep, tarsus with a short tactile seta distad of the middle and clearly longer than breadth of tarsus, claws smooth, subterminal seta smooth, curved.

Type species: *Spelaeochernes dentatus* sp. n.

Distribution: Brazil, caves.

Of the genera possessing a flagellum of 4 blades, the new genus is similar to *Semeiochernes* Beier and *Neochelanops* Beier, which share the following characters: trichobothrial pattern, 6-7 seta on cheliceral palm, shape of galea and presence of a short “pseudotactile” seta on tarsus IV. It differs from both genera in the shape of the spermatheca (see figs 112, 113; Mahnert, 1987, fig. 25; Mahnert, 1985, figs 28-30). Muchmore (1999) redefined the genus *Chelanops* Gervais and considered *Neochelanops* a good genus. The spermatheca of *Spelaeochernes* gen. n. seems quite similar to that of *Epichernes* Muchmore (from Mexico) (Muchmore & Hentschel, 1982), but the latter genus has a long tactile seta on tarsus IV.

The genus *Rhopalochernes* Beier (type species *Chelifer ohansi* Tullgren), which has a (pseudo-)tactile seta in the distal half of tarsus IV, clearly differs from the new genus in the following characters: flagellum 3 blades (fide Beier, 1932), morphology of spermatheca (fig. 111) and trichobothrial pattern (fig. 110): *est*-*ist*-*it*-*et* more or less equidistant from each other, *est* clearly in basal half of fixed finger, *st* of movable finger nearer to *sb* than to *t*. The flagellum could not be studied in the syntypes of *Chelifer ohansi* (2♂ 1♀; Mus. Hamburg, Typen Kat. Nr. 260, from Brazil, Rio de Janeiro, Petropolis, in *Bromelia*): two of the specimens lacked the chelicerae and those of the third were not dissected.

Spelaeochernes dentatus sp. n.

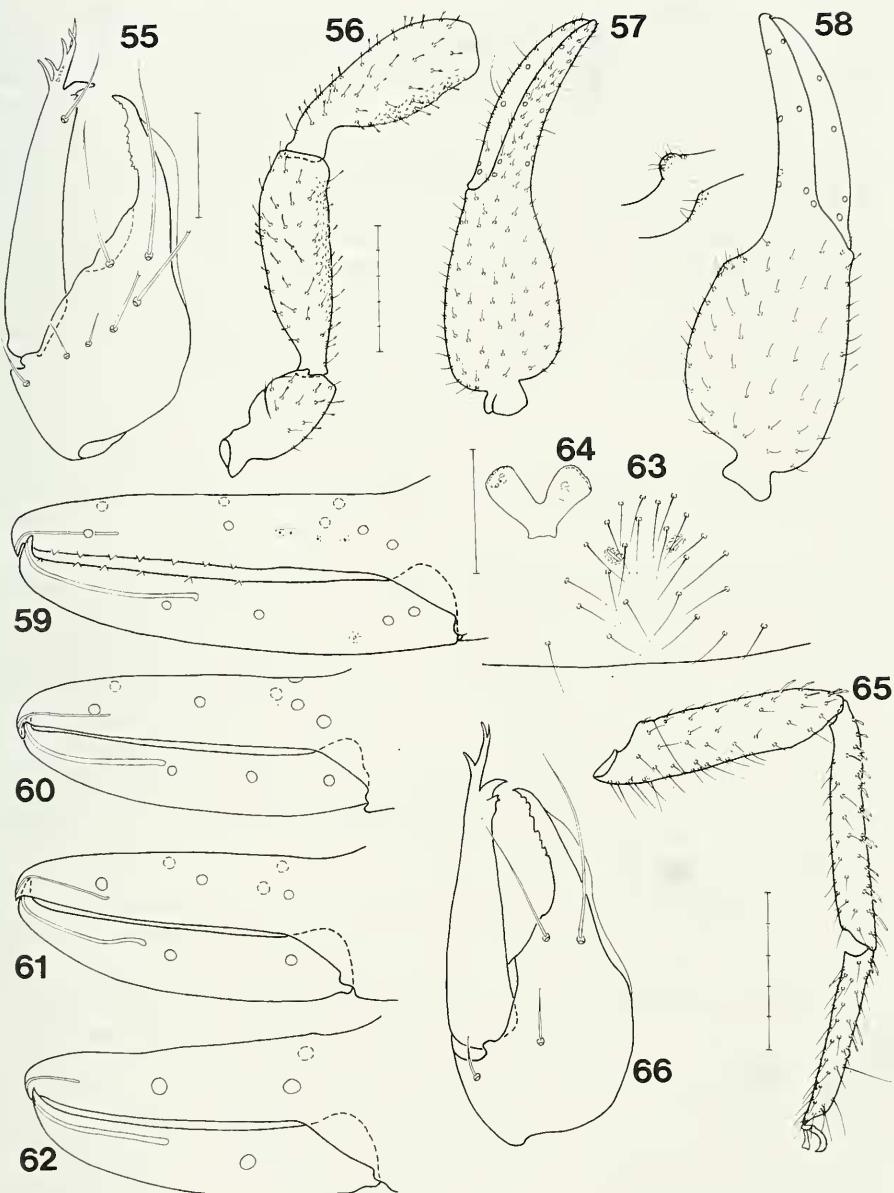
Figs 55-66

Chelanops sp. (117); Pinto-da-Rocha, 1995: 85 (SP-02, SP-47)

Material: Paraná, Gruta de Água Boa, Almirante Tamandaré, Ig. R. Pinto-da-Rocha, 4.III.1990: 1♀ (holotype) (5317), 1♂ 2♀ (5318); Almirantes Tamandaré, Gruta de Terra Boa, Ig. R. Pinto-da-Rocha, 4.III.1990: 1♀ (5318); Gruta da Rocha, Adrianópolis, Ig. R. Pinto-da-Rocha & N. Moraccholi, 10.III.1991: 5♂ 1♀ IT (MZUSP 14106); Gruta Ermídia Paiol do

Alto, Adrianópolis, R. Pinto-da-Rocha & N. Moraccholi Ig., 13.III.1991: 1♂ 1♀ (MZUSP 14104); Gruta do Maciel, Adrianópolis, Ig. R. Pinto-da-Rocha, 6.III.1991: 6 ex. (MZUSP 14103); Gruta de Olhos d'Água, Campo Largo, 2.IX.1990. Ig. R. Pinto-da-Rocha: 1♂ (5325) IP (5314); Gruta da Lacinha, Rio Branco do Sul, Ig. R. Pinto-da-Rocha, 10.I.1988: 1♀ (5316); 31.V.1987: 1T (5570); Gruta de Toquinhas, Rio Branco do Sul, Ig. R. Pinto-da-Rocha, 28.VI.1987: 1♂ (5577); Gruta do Toca, Rio Branco do Sul, Ig. R. Pinto-da-Rocha, 19.VIII.1989: 1D (5313); Gruta Morro de Pedra, Guaraqueçaba, Ig. R. Pinto-da-Rocha, 16.VIII.1987: 3♂ (5575); Gruta do Bom Sucesso, Cerro Azul, Ig. R. Pinto-da-Rocha, 3.IV.1991: 2♂ 1♀ (MZUSP 14105); Gruta Paiol de Capim, Cerro Azul, Ig. R. Pinto-da-Rocha, 4.IV.1991: 1♀; São Paulo, Caverna Córrego Grande, Iporanga, in guano, Ig. E. Trajano, 31.III.1983: 1♀ (MZUSP 10299); Gruta do Betari, Iporanga, Ig. P. Gnaspi Netto, 15.X.1988: 1♂ (MZUSP 10303); 27.X.1986, in guano of bloodsucking bats: 2♀ (MZUSP 10302); same cave, Ig. E. Trajano & P. Gnaspi, 1.VII.1992: 1♂ (MZUSP 13842); Caverna Morro Preto, Iporanga, Ig. P. Gnaspi Netto, 31.VIII.1986: 1D (MZUSP 10296); Caverna Casa de Pedra, Iporanga, in guano of bloodsucking bats, Ig. P. Gnaspi Netto, 25.V.1986: 1♂ 1♀ (MZUSP 10304); 15.X.1988: 1♀ 2T (MZUSP 10307); Gruta do Tatu, Iporanga, Ig. E. Trajano, 17.IV.1989: 1♂; Gruta do Moquem, Iporanga, Faz. Intervales, Ig. E. Trajano & P. Gnaspi: 1♀ (MZUSP 13836); Gruta do Jair, Iporanga, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 7.X.1990: 2T (MZUSP 13808); Gruta do Tufo, Iporanga, Faz. Intervales, Reg. Figueira, Ig. P. Gnaspi, 16.IV.1989: 1♀; Caverna Pescaria, Iporanga, Espírito Santo region, Ig. E. Trajano & P. Gnaspi, 8.IV.1990: 1♂ (MZUSP 13815); Gruta da Figuiera, Iporanga, Fazenda Intervales, Ig. E. Trajano, 1.III.1990: 3♂ 1♀ 1D (MZUSP 13806); Gruta do Espírito Santo, Iporanga, Caboclos, Espírito Santo region, Ig. E. Trajano & P. Gnaspi, 1.VIII.1992: 1♀ (MZUSP 13841); Gruta do Rio Preto, Guapiara, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 7.X.1992: 1♂ IP (MZUSP 13839); Gruta dos Pianos, Guapiara, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 7.X.1992: 1♂ 1T (MZUSP 13837); Gruta Sítio das Cavernas, Ribeirão Grande, Faz. Intervales, Ig. E. Trajano & P. Gnaspi, 3.IV.1992: 1♀ (MZUSP 13840); Gruta dos Meninos, Ribeirão Grande, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 3.IV.1992: 1♀ (MZUSP 13834); Caverna do Grotão, Ribeira, Ig. N. Moraccholi, guano de insectivores, 9.III.1991: 4♂ 4♀ 4D 5P (MZUSP 14102); Caverna do Diabo (= Tapagem), Eldorado, Ig. P. Gnaspi Netto, 14.X.1987: 1♀ (MZUSP 10307); same cave, Ig. E. Trajano & P. Gnaspi, 18.XI.1991: 2♀ (MZUSP 13822) (all paratypes).

Description: Carapace 1.1-1.3 times as long as broad, 2 faint eye-spots present; subbasal transverse furrow (nearly smooth at bottom) slightly nearer to posterior border than to median furrow; pro- and mesozone smooth, other parts scarcely granulate, no central modification ("keel") at posterior margin; 4 setae at anterior and 7-11 at posterior margin, one smooth preocular seta on each side; setae short, clavodentate; tergites divided, anterior ones faintly granulate, posterior ones scaly, mostly 4-5 clavodentate setae (slightly longer on posterior tergites) at posterior border and one median and one lateral anterior seta (III-X), XI 6-8 (2 lateral tactile setae, 2 median discal setae); lobe of pedipalpal coxa with 3 marginal and 1-2 discal setae, pedipalpal coxa mediodistally finely granulate, ca. 50 setae (1 tactile seta), coxa I 15-20, II 18-26, III 22-26, IV 26-36, setae smooth; anterior genital operculum of male 34-41 setae (inner ones longer), of female (fig. 63) 19-25 setae (double-rowed), spermatheca as in fig. 64; sternites divided, faintly scaly, setae long and acuminate: one seta on each stigmal margin, normally 5-7 setae at posterior border of each half sternite, 1 lateral and 1 medial anterior setae on IV-X; XI with 8 setae (2 lateral and 2 medio-discal tactile setae); anal cone 2+2 smooth setae. Chelicera: palm with 6-7 setae (2-3 apically dentate; fig. 55), fixed finger with 5-7 larger and 2-3 tiny teeth, movable finger with tooth-like subapical lobe; galea with 6 rami, flagellum of 4 blades (anterior one



FIGS 55-66

Spelaeochernes dentatus gen.n.sp. n.; 55: chelicera ♀; 56-57: pedipalp ♀; 58: chela ♂, with different expressions of median tubercle; 59-62: trichobothrial pattern of ♀, trito-, deutero- and protonymph; 63-64: female genital operculum and spermatheca; 65: leg IV; 66: chelicera of protonymph; scale unit 0.1 mm.

dentate), serrula exterior of 19-23 blades. Pedipalps (figs 56-58) densely granulate, setae dentate, those on basal parts slightly clavate, trochanter with distinct dorsal and indistinct ventral hump, femur slightly club-shaped, 3.2-3.5 times as long as broad, patella 2.6-3.0, club 1.9-2.2, hand with pedicel 1.8-2.0 (female) or 1.7-1.9 (male) times as long as broad and 1.08-1.20 times as long as finger; chela with pedicel 3.1-3.6 (female) or 3.0-3.4 (male) as long as broad, finger 1.48-1.70 (male) or 1.55-1.86 (female) longer than hand breadth; fixed finger with 56-67 marginal teeth and 6-10 exterior and 3-5 interior accessory ones, movable finger with 61-70 marginal, 6-8 external and 2-4 internal accessory teeth; nodus ramosus of venom duct proximad *t*; a few sense-spots on base of movable and fixed finger. Trichobothrial pattern (fig. 59): *ist* at same level as *est* or nearly so. *it* slightly proximad *et*, *et* much nearer fingertip than *est*, which is slightly nearer *ib* than *et* and halfway between *eb* and *et*; *st* slightly nearer *t* than *sb*.

Leg I: femur 1.5-1.8 times, patella 3.6-4.2 times as long as deep and 1.59-1.78 times as long as femur, tibia 5.4-6.3, tarsus 6.3-7.4 times as long as deep; leg IV (fig. 65): femur+patella 4.3-5.1, tibia 6.7-7.4, tarsus 6.5-7.5 times as long as deep, tarsal tactile seta distal (TS= 0.66-0.73); claws smooth, simple, subterminal seta smooth, curved.

Measurements (in mm) of females (males) (n=8/8): carapace 0.92-1.06/0.75-0.86; pedipalps: femur 0.92-1.06/0.26-0.31 (0.91-1.17/0.27-0.35); patella 0.91-1.04/0.32-0.37 (0.91-1.18/0.31-0.41), hand with pedicel 0.93-1.10/0.47-0.57 (0.91-1.11/0.49-0.65), length of pedicel 0.10-0.13, length of finger 0.79-0.97 (0.82-1.02), chelal length (with pedicel) 1.64-1.89 (1.67-2.02); leg I: femur 0.27-0.32/0.16-0.18 (0.27-0.37/0.17-0.21), patella 0.48-0.55/0.13-0.14 (0.47-0.63/0.09-0.13), tibia 0.53-0.62/0.09-0.10 (0.52-0.72/0.09-0.11), tarsus 0.48-0.54/0.07-0.08 (0.48-0.59/0.07-0.08); leg IV: femur+patella 0.83-0.97/0.18-0.21 (0.82-1.04/0.18-0.21), tibia 0.78-0.92/0.11-0.12 (0.78-1.03/0.11-0.13), tarsus 0.58-0.68/0.08-0.10 (0.58-0.71/0.08-0.10), length of tarsal tactile seta 0.13-0.17.

Tritonymph: Carapace 1.3 times as long as broad (0.75/0.55mm), nearly smooth on central surface, laterally granulate: two distinct transverse furrows present; two indistinct eye-spots present; 4 setae on anterior, 8 on posterior border, one pre-ocular seta on each side; tergites nearly smooth (posterior ones indistinctly scaly), half tergites 3-5 setae at posterior margin, III-X with one lateral and medial anterior seta, tergite XI 6 (2 tactile setae, 2 discal setae); lobe of pedipalpal coxa 3 marginal and 1 discal setae, pedipalpal coxa granulate, 26 setae, coxa I 7, II 9, III 10, IV 12; sternite II 7 medial setae, III 3 (no suprastigmal seta), IV 3+1 suprastigmal seta on each side, V-IX 4-5 posterior setae, one lateral and one medial anterior one, X 2-3/1/1, sternite XI 7 (4 tactile setae). Chelicera: hand with 6 setae (one dentate). galea 5 rami; serrula exterior with 18 blades, flagellum 4 setae. Pedipalps granulate, femur 2.9 times as long as broad (0.58/0.20), patella 2.4 (0.55/0.22), pedicel 0.14mm, hand with pedicel 1.9 (0.58/0.30) times as long as broad and 1.06 times as long as finger, length of pedicel 0.06mm, of finger 0.55mm; chela with pedicel 3.6 times as long as broad (length 1.07mm); both fingers with 46 marginal and 2 internal accessory teeth, 5 lateral accessory teeth on fixed finger, 4 on movable finger; trichobothrial pattern as in fig. 60. Leg I: femur 1.6 times as long as broad (0.19/0.12), patella 3.3 times as long as

deep (0.30/0.09) and 1.6 times as long as femur, tibia 4.4 (0.32/0.07), tarsus 5.6 (0.34/0.06) times as long as deep; leg IV: femur+patella 3.6 times (0.55/0.15), tibia 5.5 times (0.51/0.09), tarsus 5.8 times as long as deep (0.40/0.07), tarsal tactile seta in middle (TS=0.57), length 0.13mm.

Deutonymph (n=2): Carapace 1.3 times as long as broad (0.56/0.44mm), only laterally granulate, both transverse furrows distinct, eye-spots faint, 4 setae at anterior, 6 at posterior border; chaetotaxy of half-tergites: I-III 3-4, IV-X 2 posterior setae, one lateral and one medial anterior setae, tergite XI: 6 (2 tactile setae, 2 discal setae); lobe of pedipalpal coxa 3 marginal setae, pedipalpal coxa 13 (1 tactile seta), coxa I 5, II 5-6, III 6-7, IV 7; half-sternites 2-3 posterior setae, one lateral and one medial anterior setae (V-X), sternite XI: 6 (4 tactile setae). Chelicera: hand with 5 setae (one dentate), galea 4 rami, serrula exterior 15 blades, flagellum 4 setae. Pedipalps granulate, femur 2.7 times as long as broad (0.37-0.44/0.14-0.16), patella 2.2 times (0.36-0.42/0.16-0.19), pedicel 0.10-0.12 mm, hand with pedicel 2.0 times as long as broad (0.43-0.49/0.21-0.24) and 1.1 times as long as finger, length of pedicel 0.04-0.05 mm, of finger 0.38-0.43 mm, chela with pedicel 3.6 times as long as broad (length 0.77-0.89); fingers with 38-39 marginal teeth, fixed finger with one lateral and one internal accessory tooth, none on movable finger; trichobothrial pattern as in fig. 61. Leg I: femur 1.4 times as long as deep (0.13/0.09), patella 2.5 times as long as deep (0.19/0.08) and 1.5 times as long as femur, tibia 3.4 (0.21/0.06), tarsus 4.4 (0.22/0.05) times as long as deep; leg IV (n=2): femur+patella 3.3-3.4 (0.37-0.41/0.11-0.12), tibia 4.5-4.6 (0.33-0.36/0.07-0.08), tarsus 4.7-5.0 times as long as deep (0.30-0.32/0.06-0.07), tactile seta in middle (TS=0.55-0.58), length 0.10mm.

Protonymph: Carapace 1.2 times as long as broad (0.44/0.37mm), smooth, medial furrow distinct, subbasal furrow only laterally well marked; eye-spots present, chaetotaxy: 4-6, preocular setae present; half-tergites I-X 3 posterior setae, tergite XI 4 (2 tactile setae, 2 discal setae); lobe of pedipalpal coxa 2 internal marginal setae, pedipalpal coxa 5 (1 tactile seta), coxa I-II 4, III-IV 5; half-sternite III 1, IV 2+1 suprastigmal seta, V-X 3, sternite XI 4 (4 tactile setae). Chelicera (fig. 66): hand with 4 acuminate setae, galea 3 rami, serrula exterior 13 blades, flagellum 4 setae. Pedipalps granulate, femur 2.3 (0.28/0.12), patella 2.1 (0.27/0.13), hand with pedicel 1.9 (0.32/0.17) as long as broad and 1.2 times as long as finger, length of finger 0.27mm; chela with pedicel 3.4 (length 0.58mm). Fingers with 27 marginal teeth, accessory teeth lacking; trichobothrial pattern as in fig. 62. Leg I: femur 1.5 (0.10/0.07), patella 2.3 (0.14/0.06), tibia 3.0 (0.16/0.05), tarsus 4.2 (0.18/0.04) times as long as deep; leg IV: femur+patella 3.6 (0.29/0.08), tibia 4.0 (0.24/0.06), tarsus 4.8 (0.23/0.05) times as long as deep, tarsal tactile seta in middle (TS=0.49).

Etymology: *dentatus* (lat.), refers to the hump on the internal side of male chelal hand.

Spelaeochernes altamirae sp. n.

Figs 73-78

Material: Pará, Caverna de Limoeiro, Altamira-Itaituba region, Medicilândia, lg. E. Trajano, 17.X.1988: 1♀ (holotype), 1♂ 1♀ 2T (MZUSP 10286); same data, in guano of insectivorous bats: 1T 1D (MZUSP 10287); Caverna Planaltina, Medicilândia, lg. E. Trajano, 12.X. 1988, in guano of vampire bats: 1♀ (MZUSP 10285); same data: 2♂ 2♀ (MZUSP 10284) (all paratypes).

Description (characters not mentioned are similar to those observed in *dentatus* sp. n.): Body and appendages well sclerotized. Carapace 1.2-1.4 times longer than broad, broadest at middle, both transverse furrows distinct and granulate (nearly smooth in male), subbasal furrow nearer to posterior margin than to median furrow or mid-way between them (1♀); medial surface of pro- and mesozone nearly smooth, that of metazone scarcely, laterally distinctly granulate; setae 6 on anterior, 6-9 on posterior border, one preocular seta on each side. Tergites divided (except XI), anterior ones granulate, posterior ones scaly (ctenoid), setae clavodentate, not much longer on last tergites, each half-tergite with 4-5 posterior setae. XI 6-8. Pedipalpal coxa medially and laterally granulate, 30-37 setae (1 tactile seta), coxa I 9-14, II 14-17, III 16-19, IV 26-32 (setae smooth, acuminate); anterior genital operculum of female with a double row of 16-18 setae, that of male with 28 setae arranged in a two-rowed semi-circle (inner setae much longer); spermatheca with paired, very short sacs (fig. 77). genital chamber of male with 2x2 short smooth setae; sternal chaetotaxy: mostly 5-8 posterior setae (III 3, IV 1 suprastigmal setae). XI: 6-7. Intersegmental membrane undulate, pleural membrane papillose. Palm of chelicera 6-7 setae (fig. 73), 1-3 apically dentate, galea with 6 rami, serrula exterior of 18-19 blades. Pedipalps (figs. 74-75) distinctly, hand indistinctly granulate; setae short, dentate and slightly clavate; femur with short pedicel, distally not broadened, 3.7-4.2 times as long as broad, patella 3.2-3.3 times, club 2.5 times, hand with pedicel 2.0-2.3 times as long as broad and 1.08-1.14 times as long as fingers, chela with pedicel 3.6-4.2 (without 3.3-4.0) times as long as broad. Fixed finger with 51-54 marginal teeth, 1-4 lateral and one internal accessory teeth, movable finger with 51-62 marginal, 0-1 lateral and 0 internal accessory teeth. Trichobothrial pattern (fig. 76): *ist* distad *est* (1♀: both at same level), *st* slightly nearer to *st* than to *sb*; *nodus ramosus* between *t* and *st*, usually somewhat nearer to *t*. Leg I: femur 1.8-2.0 times as long as deep, patella 3.7-4.5 as long as deep and 1.50-1.72 times as long as femur, tibia 5.7-6.2 times, tarsus 6.8-7.5 times as long as deep; leg IV (fig. 78): lateral/dorsal setae slightly clavodentate, internal ones acuminate; femur+patella 4.5-5.0, tibia 6.9-7.6 times as long as deep and 1.21-1.34 times as long as tarsus, tarsus 6.6-7.5 times as long as deep, a short acuminate seta (as long as breadth of tarsus) in distal third (TS=0.65-0.72).

Measurements (in mm) (n: 5♀ 3♂): Carapace 0.67-0.78/0.51-0.60; pedipalps: femur 0.70-0.77/0.17-0.21, patella 0.65-0.72/0.20-0.23, pedicel 0.14-0.19, hand with pedicel 0.64-0.75/0.27-0.36, pedicel 0.07-0.10, finger length 0.59-0.66, chelal length (with pedicel) 1.16-1.36; leg I: femur 0.22-0.25/0.11-0.13, patella 0.34-0.41/0.07-0.10, tibia 0.39-0.47/0.06-0.07, tarsus 0.39-0.45/0.05-0.06; leg IV: femur+patella 0.62-0.71/0.13-0.14, tibia 0.58-0.67/0.08-0.09, tarsus 0.44-0.51/0.06-0.07, length of tarsal tactile seta 0.08-0.09.

Tritonymph: Half-tergites with 3-4 posterior setae and (III-X) one anterior lateral and medial one. sternite II with 4 (2-2) medial setae, half-stermites with 4-5 (6) marginal setae and one medial (VI) and one lateral (VIII) anterior one; palm of chelicera with 5-6 setae (one dentate), galea with 5 branches, serrula exterior 17 blades, flagellum with 4 setae (distal one dentate). Pedipalps: Femur 3.1 times as long as broad (0.49/0.16mm), patella 2.5 times (0.48/0.18), hand with pedicel 1.9 times

(0.50/0.26) as long as broad and 1.08 times as long as finger, finger length 0.46mm, chela with pedicel 3.5 times (length 0.92mm); fixed finger with 46 marginal teeth and one interior accessory tooth, movable finger with 47 marginal teeth, no accessory teeth. Leg I: femur 1.8 times (0.18/0.10), patella 3.3 times (0.25/0.08) times as long as deep and 1.45 times as long as femur, tibia 4.8 times (0.28/0.06), tarsus 5.7 times (0.30/0.05) as long as deep. Leg IV: femur+patella 4.3 times (0.47/0.11), tibia 6.0 times (0.42/0.07) as long as deep and 1.2 times as long as tarsus, tarsus 6.0 times (0.35/0.06), with short smooth subapical seta (TS=0.65, length 0.07mm).

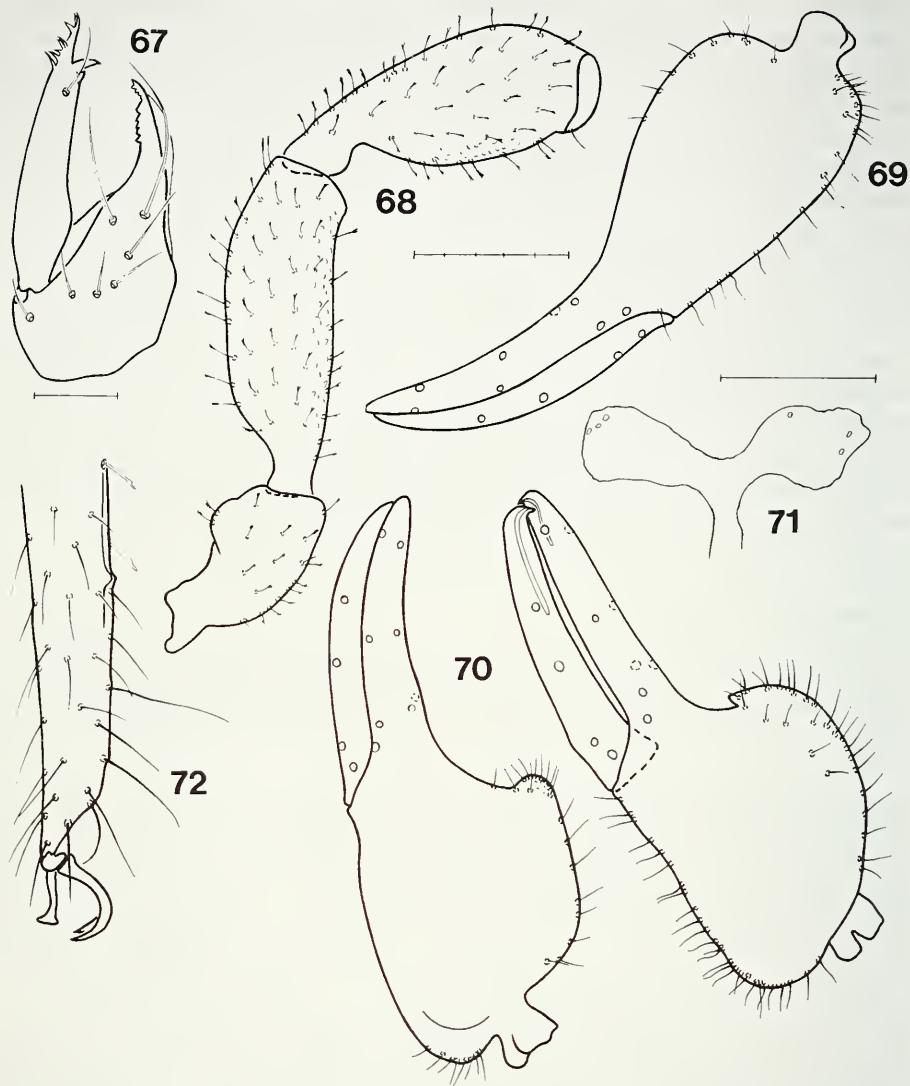
Deutonymph: Carapace 1.3 times as long as broad (0.45/0.35mm), 6 setae on anterior and posterior border; half tergites I-III 3 setae, IV-IX 1 posterior, 1 lateral and 1 medial anterior seta, XI 6 (2 medial discal and 2 tactile setae); half sternites with 4-5 posterior setae. Chelicera: palm with 5 setae (one dentate), serrula exterior 14 blades, flagellum 4 setae. Pedipalps granulate, femur 2.9 times as long as broad (0.34/0.12), patella 2.4 times (0.32/0.14), hand with pedicel 2.0 times (0.38/0.19) as long as broad and 1.24 times longer than finger, finger length 0.30mm, chela with pedicel 3.6 times, length 0.66mm; fixed finger apically broken, movable finger 35 teeth, no accessory teeth. Leg IV: femur+patella 4.0 times (0.33/0.08), tibia 5.0 times (0.29/0.06), tarsus 5.5 times (0.26/0.05); length of "tactile" seta 0.06mm, TS=0.62.5.

Spelaeochernes armatus sp. n.

Figs 67-72

Material: Santa Catarina, Gruta de Botuverá, Botuverá, 27°13'S/49°09'W, lg. R. Pinto-da-Rocha, 17.-19.I.1998; 1♀ (holotype), IT 1P (MZUSP 16593); same cave, lg. R. Pinto-da-Rocha & Sessegolo, 5.-6.II.1998; 1♂ 1D (MZUSP 16595); Gruta de Botuverá II, Botuverá, lg. R. Pinto-da-Rocha & Sessegolo, 5.-6.II.1998; 1♂ (MZUSP 16594) 2T (MZUSP 16596) (paratypes).

Description: Carapace with two distinct, transverse, only slightly granulate furrows, subbasal one slightly nearer to posterior margin than to median furrow and curved backwards, median parts of pro- and mesozone smooth, otherwise coarsely granulate, 4-6 + 1 smooth preocular seta at anterior, 11-12 at posterior border (with some supplementary submarginal setae), 1.2-1.3 times as long as broad; tergites divided (except XI), anterior ones granulate, posterior ones (XI included) ctenoid-scaly, with 4-7 posterior setae, XI 8; setae on anterior tergites clavate and dentate, on XI dentate; palpal coxa laterally granulate, about 35 (1 tactile seta), coxa I 16-21, II 21-22, III 20-22, IV about 30; anterior genital operculum of male with about 35 smooth setae arranged in two rows, that of female with about 30 setae; spermatheca as in fig. 71; entrance of male genital chamber with 3 smooth setae on each side, half-sternites mostly with 6-8 (9) posterior setae, III 3 suprastigmatal setae, IV 1 suprastigmatal seta, XI 8 setae, coxal and sternal setae smooth and pointed; pleural membrane granulate. Chelicera (fig. 67): palm 6-7 smooth setae (in one female two setae apically indistinctly dentate), galea 8-10 branches, serrula exterior 21-22 blades. Pedipalps (figs 68-70): trochanter, femur and patella coarsely granulate, femur gradually enlarged from pedicel, club-shaped, 3.1-3.3 times as long as broad, lateral setae slightly longer than medial ones and more clavate, patella 2.7-3.0 times, club 1.9-2.3 times as long as broad, hand nearly smooth, in male with a dorsodistal anteriad-



FIGS 67-72

Spelaeochernes armatus sp. n.: 67: chelicera; 68-70: pedipalp (69: ♀; 70: male chela in different positions); 71: spermatheca; 72: tarsus of leg IV; scale unit 0.1mm (71: 0.05mm).

directed and granulate protuberance. the ventrobasal angle of female with a setose patch, with pedicel 1.5 (δ) or 1.8-1.9 (φ) times as long as broad and 1.0-1.1 times longer than finger, fingers not gaping, 1.43 (δ) or 1.64-1.78 (φ) longer than hand breadth; chela with pedicel 2.5 (δ) or 3.1-3.4 times as long as broad; fixed finger with

58-61 marginal teeth, 9-11 external and 4-5 internal accessory teeth, movable finger with 63-67 marginal, 7-9 external and 3 internal accessory teeth. Trichobothria: *ist* and *est* at same level in middle of the finger, *it* slightly proximal to *et*, 3-4 sense-spots between *esb* and *est*, *st* closer to *t* than to *sb*, 2 sense-spots between *sb* and *st*; nodus ramosus proximad *t* and *it*. Leg I: femur 1.65-1.8 times, patella 3.5-4.1 times as long as deep and 1.6-1.7 times longer than femur, tibia 5.6-6.2 times, tarsus 6.6-6.9 times; leg IV: femur+patella 4.7-4.8 times, tibia 6.9-7.6 times, tarsus with a short tactile seta in subdistal position (TS=0.65-0.71), 6.0-7.6 times as long as deep.

Measurements (1♂; 2♀ in parentheses): Carapace 1.13/0.92 (1.01-1.10/0.80-0.90); Pedipalps: femur 1.08/0.40 (1.00-1.07/0.31-0.33), patella 1.08/0.40 (0.99-1.07/0.34-0.38), hand with pedicel 1.03/0.70 (1.01-1.10/0.55-0.63), finger length 1.00 (0.98-1.03), chelal length with pedicel 1.74 (1.89-2.02); Leg I (♂ ♀): femur 0.33-0.34/0.18-0.21, patella 0.54-0.57/0.13-0.16, tibia 0.61-0.66/0.10-0.12, tarsus 0.55-0.59/0.08-0.09; Leg IV: femur+patella 0.91-1.01/0.19-0.21, tibia 0.90-0.95/0.12-0.13, tarsus 0.64-0.60/0.09-0.11, length of tarsal tactile seta 0.14-0.15.

Etymology: *armatus* (lat.), refers to presence of a strong protuberance on the male chelal hand.

Discussion: Close affinities apparently exist between this new species and *dentatus* sp. n., as indicated by the shared presence of a more or less pronounced protuberance on the male palpal hand, a gradually enlarged palpal femur and the non-gaping chelal fingers. *Sp. armatus* can be distinguished from *dentatus* by the shape of the male chelal hand (protuberance much stronger), the setiferous basoventral corner of the hand in both sexes and the number of galeal branches (9-10 vs. 6).

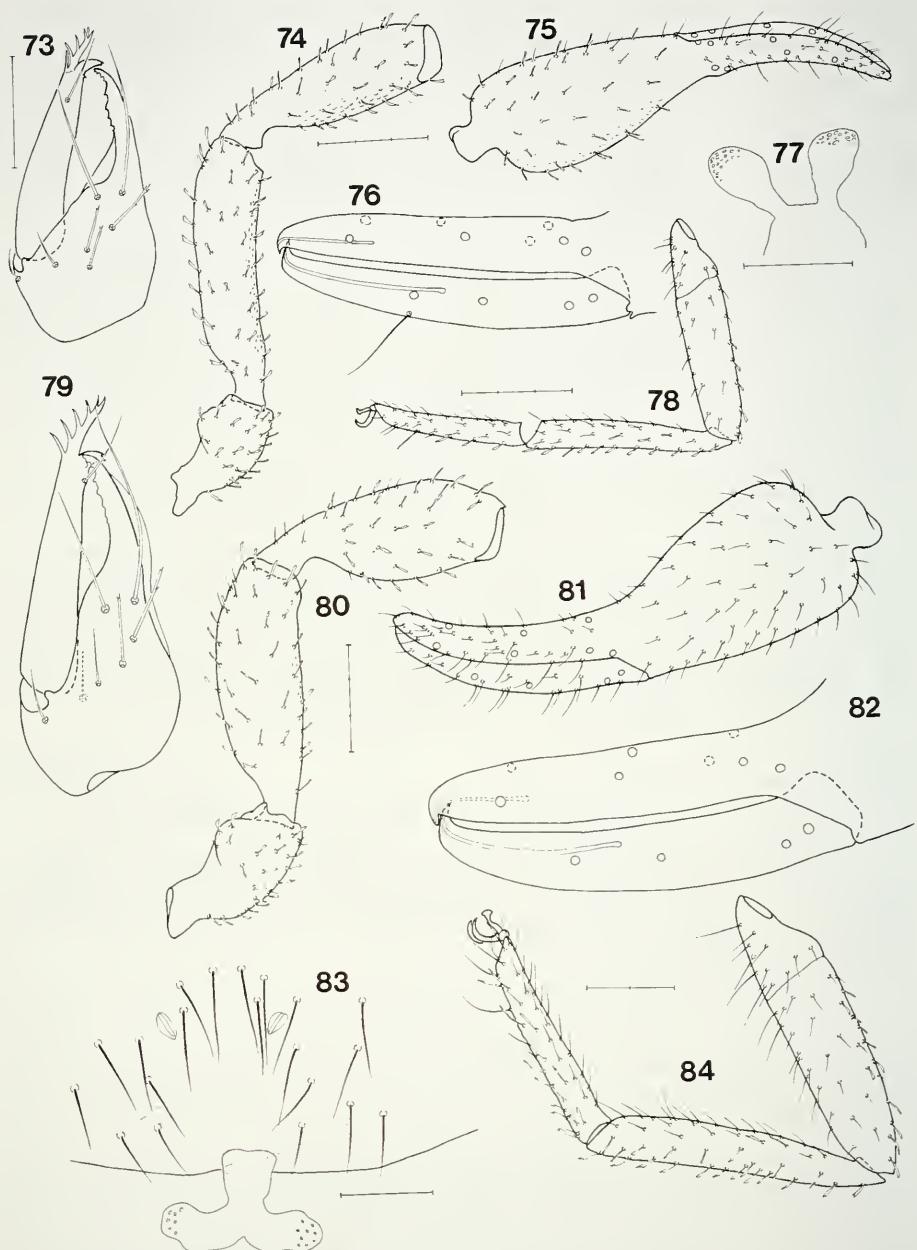
Spelaeochernes bahiensis sp. n.

Figs 85-90

Chelanops sp. (117); Pinto-da-Rocha, 1995: 85 (BA-72; BA-BOD, BA-POC)

Material: Bahia, Poço Encantado, Itaetê, Ig. E. Trajano & P. Gaspini, 1.IX.1991: 1♀ (holotype), 1♂ (paratype) (MZUSP 13780); Lapa do Bode, Itaetê, Ig. E. Trajano & P. Gaspini, 4.IX.1991: 1♂ 1♀ (MZUSP 13779); Gruta da Gameleira, Campo Formosa, Ig. L. Horta Senna, 2.I.1994: 1♂; Lapa II (Santa Rita cave system), Iraquara, Ig. E. Trajano & P. Gaspini, 5.IX.1991: 1♂ (MZUSP 13781) (paratypes).

Description: Pedipalps and carapace reddish-brown, tergites widely divided, yellowish-brown; carapace with two distinct transverse granulate furrows, subbasal one curved backwards and nearer to posterior margin than to median furrow, coarsely granulate, no central modification at posterior border, 4 + 1 dentate preocular seta at anterior, 6-8 at posterior border; tergites divided (except I, XI), anterior ones granulate, posterior ones (XI included) ctenoid-scaly, with 4-5 posterior setae, XI 7-8; palpal coxa distally granulate, 21-30 (I tactile seta), coxa I 8-10, II 8-14, III 9-14, IV 13-21; anterior genital operculum of male with about 35 smooth setae arranged in two rows, that of female with about 20 setae; spermatheca as in fig. 89; entrance of male genital chamber with 1-3 smooth setae on each side, half-sternites mostly with 3-4 posterior setae, III 2 suprastigmatal setae, IV 1 suprastigmatal seta, XI 6-8, coxal and sternal setae smooth and pointed. Pleural membrane with pointed granula. Chelicera (fig. 85): palm 5-6 setae (I or 2 indistinctly dentate), galea 6 branches, serrula exterior 18-20 blades.



FIGS 73-84

73-78: *Spelaeochernes altamirae* sp. n.; 73: chelicera; 74-76: pedipalp; 77: spermatheca; 78: leg IV; 79-84: *Spelaeochernes dubius* sp. n.; 79: chelicera (stippled: supplementary seta on right cheliceral palm); 80-82: pedipalp; 83: genital operculum and spermatheca; 84: leg IV: scale unit 0.1mm (77, 83: 0.05mm).

Pedipalps (figs 86-88): trochanter coarsely granulate, femur and patella densely granulate, femur gradually enlarged at base, club-shaped, 3.1-3.3 (δ) or 3.4-3.5 (φ) times as long as broad, lateral setae slightly longer than medial ones and more clavate, patella 2.5-2.7 (δ) or 2.75-2.9 (φ) times, club 1.8-2.0 (δ) or 2.05-2.2 (φ) times as long as broad, hand medially finely granulate, with pedicel 1.7 (δ) or 1.8-2.0 (φ) times as long as broad and 1.1-1.2 times longer than finger, finger 1.35-1.57 (δ) or 1.59-1.74 (φ) longer than hand breadth; chela with pedicel 2.9-3.1 (δ) or 3.3-3.5 (φ) times as long as broad; palpal fingers clearly gaping (movable finger curved), fixed finger with 45-50 (δ) or 51-55 (φ) marginal teeth, 6-9 external and 3-5 internal accessory teeth, movable finger with 48-51 (δ) or 56-57 (φ) marginal, 3-6 external and 2-4 internal accessory teeth. Trichobothria: *ist* and *est* more or less at same level in middle of the finger, *it* proximad *et*, three sense-spots between *esb* and *est*, *st* halfway between *sb* and *t*, one modified seta distad *st*, 2 sense-spots between *sb* and *st*; nodus ramosus proximal to *t* and near *it*. Leg I: femur 1.7-2.0 times, patella 3.8-4.8 times as long as deep and 1.62-1.78 times longer than femur, tibia 6.1-7.4 times, tarsus 6.7-8.3 times longer than deep; leg IV (fig. 90): lateral setae of femur and tibia clavate, femur+patella 4.6-5.8 times, tibia 7.3-8.8 times, tarsus 7.3-8.1 times as long as deep, with a slightly longer, smooth seta in subdistal position (TS=0.72-0.73).

Measurements (in mm): carapace 0.77-0.87/0.60-0.67; pedipalps: femur 0.72-0.87/0.23-0.28, patella 0.71-0.84/0.27-0.32, hand with pedicel 0.72-0.87/0.41-0.50, finger length 0.65-68 (φ : 0.70-0.76), chela with pedicel 1.28-1.53; leg I: femur 0.21-0.28/0.12-0.15, patella 0.37-0.50/0.10-0.12, tibia 0.42-0.55/0.07-0.08, tarsus 0.36-0.46/0.05-0.6; leg IV: femur+patella 0.64-0.84/0.13-0.16, tibia 0.61-0.80/0.08-0.10, tarsus 0.45-0.54/0.06-0.07, length of tarsal tactile seta 0.08-0.09.

Etymology : refers to the state of Bahia.

Spelaeochernes dubius sp. n.

Figs 79-84

Chelanops sp. (117): Pinto-da-Rocha, 1995: 85 (SP-170, SP-VIS).

Material: São Paulo, Fazenda da Toca (sandstone cave), Serra Geral region, Analândia, lg. E. Sterlino Bergo, 1.V.1982; 1 φ (holotype); Vista da Cachoeira (sandstone cave), Serra Geral region, Ipeúna, lg. E. Trajano & P. Gnaspi, 26. X.1991; 5 δ (MZUSP 13825); Gruta Fazendão (sandstone cave), Serra Geral region, Ipeúna, lg. Santas & Bichurt, X.1977; 2 ex. (in poor condition); same cave, lg. Biaker, 8. VI.1997; 1 φ (MZUSP 16588); Gruta do Bocão, Fazenda Intervales, Iporanga, lg. P. Gnaspi Netto, 30.VII.1988; 1 φ (paratype) (MZUSP 10292); Minas Gerais, Gruta Córrego do Capão, Capim Branco, lg. L.S. Horta, 26. I.1992; 1 φ ; Gruta do Intoxicado, Pedro Leopoldo, em guano, lg. L.S. Horta, 1. VII.1995; 2 φ 1T 2D; Buraco (=Lapa) do Medo, Sete Lagoas, lg. L.S. Horta, 30. IV.1995; 1 φ ; Mato Grosso do Sul, Gruta Harmonia, Bonito, lg. E. Trajano & P. Gnaspi, 22.VII.1992; 1 δ 2 φ 1D (MZUSP 13788); Gruta Pitangueiras, Bonito, lg. E. Trajano & P. Gnaspi, 16.VII.1992; 1 φ (MZUSP 13793); same cave, lg. J.J. Geoffroy, 15.IV.1998; 2 δ 1 φ (MZUSP 16583); Gruta Lago Azul, Bonito, lg. E. Trajano & P. Gnaspi, 19.X.1990; 1 δ (all paratypes).

Description: Carapace laterally granulate, two distinct, smooth transverse furrows present, subbasal one straight and slightly nearer to posterior border than to medial furrow, 4 setae + one nearly smooth preocular seta at anterior and 10 setae at posterior margin; tergites divided (except XI), anterior ones granulate, posterior ones

scaly, intersegmental membrane granulate, half-tergites with 4-6 posterior setae, XI 8; palpal coxa laterally granulate, with microsculpture, about 30 setae, coxa I 9-17, II 11-25, III 14-23, IV 24-31; anterior genital operculum of male with 32 setae (inner ones longer), that of female with about 20 setae, spermatheca as in fig. 83; entrance of genital chamber with 2-3 setae on each side, half sternites normally with 6-8 posterior setae, III with 3, IV with 1 suprastigmal seta, V-X also with a lateral and medial anterior seta, sternite XI 8 setae; pleural membrane with pointed granula, intersegmental membrane of sternites undulate. Chelicera (fig. 79): palm with 6-7 setae (normally 2 dentate; one male apparently with only smooth setae), serrula exterior normally 19-20 blades, galea with 6 branches. Palps (figs 80-81) coarsely granulate, only hand finely granulate, trochanter with distinct dorsal hump, femur gradually enlarged from pedicel, lateral seta clavodentate and longer than dentate medial setae, 3.0-3.6 times as long as broad, patella 2.5-2.9 times, club 1.8-2.1 times as long as broad and 2.4-3.0 times longer than pedicel, hand with pedicel 1.6-1.9 times as long as broad and 1.02-1.22 times longer than finger, finger 1.39-1.59 (♂) or 1.51-1.80 (♀) longer than hand breadth; chela with pedicel 2.8-3.4 times as long as broad; fixed finger with 50-66 marginal and 5-10 external and 3-4 internal accessory teeth, movable finger with 52-66 marginal, 4-6 external and 1-3 internal teeth. Trichobothria (fig. 82): 1st slightly distad or proximad *est*, 3-4 sense-spots between *esb* and *est*, 0-2 near *sb*, a short slightly lanceolate seta and a sensillum distal to *st*. Leg I: femur 1.6-1.8 times, patella 3.4-4.3 times as long as deep and 1.66-1.84 times longer than femur, tibia 5.0-6.6 times, tarsus 6.1-7.9 times as long as deep; leg IV (fig. 84): femur+patella 4.1-5.0 times, tibia 6.3-7.8 times, tarsus 6.4-8.1 times as long as deep, with distinct, short tactile seta.

Measurements (in mm) (12♂ 9♀): Carapace 0.72-0.99/0.63-0.73; palps: femur 0.71-1.02/0.24-0.27, patella 0.69-0.93/0.24-0.35, hand with pedicel 0.66-1.04/0.40-0.60, finger length 0.66-0.94, chelal length with pedicel 1.30-1.83; leg I: femur 0.22-0.31/0.13-0.18, patella 0.37-0.55/0.10-0.14, tibia 0.41-0.62/0.07-0.10, tarsus 0.37-0.50/0.06-0.07; leg IV: femur+patella 0.66-0.90/0.15-0.19, tibia 0.65-0.88/0.10-0.12, tarsus 0.45-0.63/0.07-0.08, length of tarsal tactile seta (0.08) 0.11-0.14mm.

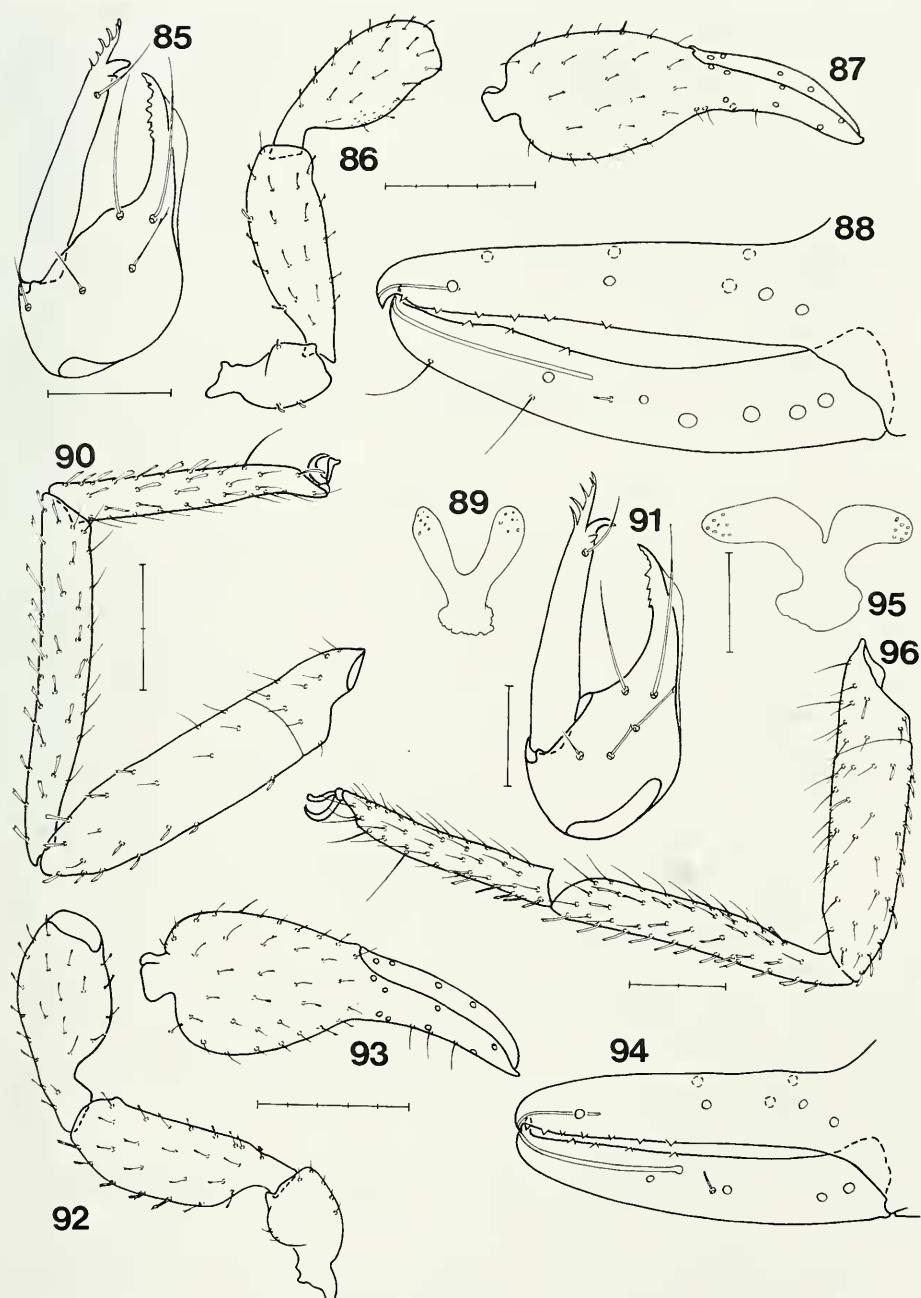
Etymology : *dubius* (lat.), refers to the doubts on its taxonomical identity I had in studying the first specimens.

Spelaeochernes eleonorae sp. n.

Figs 91-96

Chelanops sp. (117): Pinto-da-Rocha, 1995: 85 (GO-66, MG-396).

Material: São Paulo, Gruta Sertãozinho da Baixo, Altinópolis, lg. E. Trajano, 23.III.1984: 1f (holotype) 1♂ (paratype) (MZUSP 10290); Goiás, Gruta dos Ecos, Corumba de Goias, lg. E. Trajano, 11.IX.1988: 1♂ (MZUSP 10288); Gruta Qualquer Coisa, Pedro Bernardo, lg. Gregeo, 8.IV.1989: 2♂ 1♀; Minas Gerais, Gruta Tamboril, Unai, lg. Gregeo, 22.V.1989: 1♀ 1T (MZUSP 13801); Lapa Vermelha I, Pedro Leopoldo, in guano, lg. L. Senna Horta, 28.X.1995; 1♂ 1T 1D; Lapa das Pacas, Lagoa Santa, lg. L. Senna Horta, 22.VII.1995: 1♀; Gruta da Dobra, Lagoa Santa, in guano, lg. L. Senna Horta, 20.VII.1995: 1 T; Mato Grosso do Sul, Gruta do Guavirá, Bonito, lg. E. Trajano & P. Gnaspini, 29.VII.1992: 1♀ (MZUSP 13787); Gruta do Mimoso, Bonito, lg. E. Trajano & P. Gnaspini, 18.X.1990: 2T (MZUSP 13791); Gruta do Ametista, Bonito, lg. E. Trajano & P. Gnaspini, 17.X.1991: 1♂ 1T (MZUSP 13783); Gruta



FIGS 85-96

85-90: *Spelaeochernes bahiensis* sp. n. ♀; 85: chelicera; 86-88: pedipalp; 89: spermatheca; 90: leg IV; 91-96: *Spelaeochernes eleonorae* sp. n. ♀; 91: chelicera; 92-94: pedipalp; 95: spermatheca; 96: leg IV; scale unit 0.1mm (89, 95: 0.05mm).

Vale do Prata, Bonito, Ig. E. Trajano & P. Gnaspi: 2♂ (MZUSP 13797); same cave, Ig. E. Trajano & P. Gnaspi, 17.VII.1992: 1♂ (MZUSP 13798); Gruta Joao Arruda, Bonito, Ig. E. Trajano, 18.X.1990: 1♂ 1♀ 2T; Gruta do Curé, Bonito, Ig. E. Trajano & P. Gnaspi, 17.X.1990: 1T (MZUSP 13784); Gruta Dona Matilde, Bonito, Ig. E. Trajano & P. Gnaspi: 1♀ (MZUSP 13786); Gruta do São Miguel, Bonito, Ig. E. Trajano & P. Gnaspi, 20.X.1990: 1♂ (MZUSP 13796); Gruta São Miguel (=Carneiro), Bonito, Ig. R. Pinto-da-Rocha & Sessegolo: 4♂ 3♀ 2T (MZUSP 16592); Caverna Santa Maria, Jardim, Ig. E. Trajano & P. Gnaspi, 20.VII.1991: 1♀ (MZUSP 13795); Gruta do X-Coqueiro, Jardim, Ig., E. Trajano & P. Gnaspi, 28.VII.1991: 1♂ (MZUSP 13799); Abismo do Poço, Jardim, Ig. E. Trajano & P. Gnaspi, 18.VII.1992: 1♂ (MZUSP 13794) (all paratypes).

Other material (non-type): Minas Gerais, Gruta Jean Louis, Sete Lagoas, Ig. F. Chalmowicz, 1984: fragments.

Description: Carapace laterally granulate, with microsculpture between granula, two distinct, granulate transverse furrows present, subbasal one slightly curved backwards and half-way between posterior margin and median furrow, 4 setae + one nearly smooth preocular seta at anterior and 8-10 setae at posterior margin; tergites divided (except XI), scaly, half-tergites with 4-6 posterior setae, XI 8; palpal coxa laterally granulate, with microsculpture, about 32-37 setae, coxa I 12-15, II 13-17, III 14-18, IV 18-37; anterior genital operculum of male with 27-32 setae, that of female with a central group of 17-26 setae; spermatheca with two short tubes (fig. 95), entrance of genital chamber with 2/3 setae; half sternites normally with 5-7 posterior setae, III with 3, IV with 1 suprastigmal seta, XI 8 setae; pleural membrane with pointed granula. Chelicera (fig. 91): palm with 6-7 setae, 1 or 2 apically dentate, serrula exterior 17-20 blades, galea with 6 branches (shorter in male). Palps (figs 92-93) coarsely granulate, only hand finely granulate, femur abruptly enlarged from pedicel, (2.5)2.7-3.1 times as long as broad, lateral setae clavodentate and longer than dentate medial setae, patella 2.3-2.7 times, club 1.7-1.9 times as long as broad and 2.54-2.89 times longer than pedicel, hand with pedicel 1.6-1.8 times as long as broad and 1.09-1.26 times longer than finger, finger 1.30-1.63 times longer than hand breadth, chela with pedicel 2.7-3.2 times as long as broad; fixed finger with 45-55 marginal, 5-8 external and 3-4 internal accessory teeth, movable finger with 49-58 marginal, 4-8 external and 2-4 internal teeth. Trichobothria (fig. 94): *ist* at same level as *est*, 3 sense-spots between *esb* and *est*, 1-3 between *sb* and *st*, a short slightly lanceolate seta and a sensillum distal to *st*. Leg I: femur 1.6-1.9 times, patella 2.9-3.9 times as long as deep and 1.57-1.84 times longer than femur, tibia 4.9-6.4 times, tarsus 5.8-7.4 times as long as deep; leg IV (fig. 96): femur+patella 3.7-4.7 times, tibia 5.6-7.4 times, tarsus 6.1-7.5 times as long as deep, with distinct, short tactile seta (TS=0.66-0.71); arolia undivided, shorter than claws, subterminal seta curved and smooth.

Measurements (in mm): Carapace 0.77-0.95/0.63-0.77; palps: femur 0.69-0.98/0.25-0.32, patella 0.68-0.86/0.28-0.37, hand with pedicel 0.71-0.92/0.44-0.57, finger length 0.60-0.81, chelal length with pedicel 1.21-1.67; leg I: femur 0.21-0.28/0.14-0.17, patella 0.35-0.53/0.11-0.15, tibia 0.39-0.58/0.08-0.10, tarsus 0.36-0.47/0.06; leg IV: femur+patella 0.64-0.87/0.14-0.20, tibia 0.58-0.80/0.09-0.12, tarsus 0.45-0.60/0.07-0.08, length of tarsal tactile seta 0.10-0.13 mm.

Etymology: named for Dra Eleonora Trajano who is promoting biospeleological research since many years.

Tritonymph: Similar to adults; carapace with 6 setae at posterior margin; palm of chelicera with 5-6 setae, galea with 5 branches; palps: patella 2.2-2.3 times as long as broad (0.49/0.22mm), chela with pedicel 3.1-3.2 times (0.95/0.29-0.31).

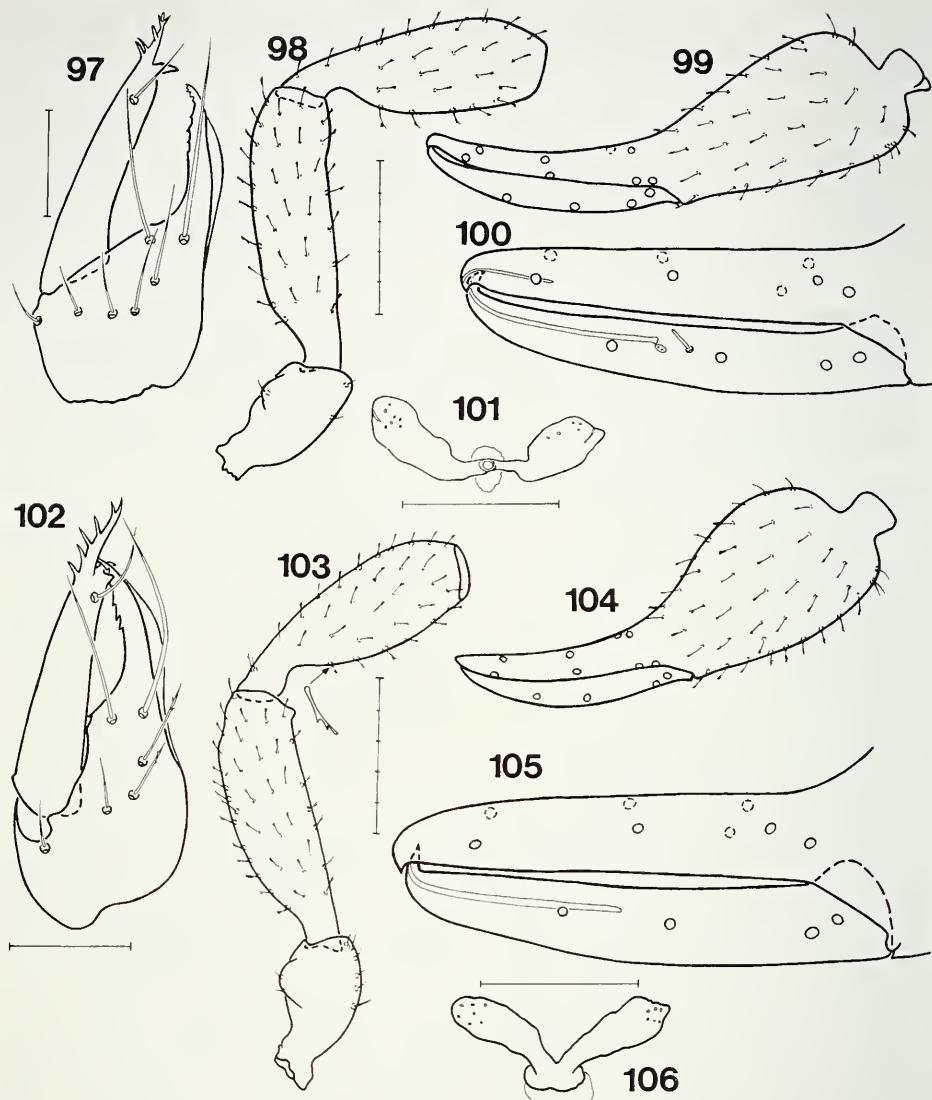
Spelaeochernes gracilipalpus sp. n.

Figs 97-101

Material: São Paulo, Gruta dos Paiva, Iporanga, Fazenda Intervales, Ig. E. Trajano, X.1996: 1♀ (holotype) 1 deutonymph; same cave, on excrement, Ig. R. E. Pinto-da-Rocha, 22.VIII.1998: 1♀; Gruta do Fóssil Desconhecido, Iporanga, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 8.X.1989: 1♀ (MZUSP 13807); Gruta Jane Mansfield, Iporanga, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 25.III.1989: 1♀ (MZUSP 13809); Gruta da Cabeça de Paca, Iporanga, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 17.XI.1990: 1♀ (MZUSP 13805); Gruta do Minotauro, Iporanga, Fazenda Intervales, Ig. E. Trajano & P. Gnaspi, 25.II.1990: 1T (MZUSP 13811); Gruta do Chapéu, Iporanga, Espírito Santo region, Ig. E. Trajano & P. Gnaspi, 10.IV.1990: 1♂ (MZUSP 13814); Caverna Arataca, Iporanga, Espírito Santo region, Ig. E. Trajano & P. Gnaspi, 28.III.1991: 1 tritonymph (MZUSP 13813); Caverna Temimina II, Iporanga, Espírito Santo region, Ig. E. Trajano & P. Gnaspi, 9.IV.1990: 1♀ 2 tritonymphs (MZUSP 13816) (all paratypes).

Other material (non-type): Minas Gerais, Gruta dos Irmãos Pirá, Matozinhos, Ig. L. S. Horta, 14.XII.1991: 1♂ (MZUSP 13833).

Description: Carapace with two distinct transverse smooth furrows, subbasal one closer to posterior margin than to median furrow, median parts of pro- and meso-zone smooth, otherwise coarsely granulate, 4-6 + 1 smooth preocular seta at anterior, 8-9 at posterior border, 1.2-1.4 times as long as broad; tergites divided (except XI), anterior ones granulate, posterior ones (XI included) ctenoid-scaly, normally with 4-6 posterior setae, XI 8; setae on anterior tergites clavate and dentate, on XI dentate; palpal coxa laterally granulate, about 35 (1 tactile seta), coxa I 18, II 23, III 28, IV about 40; anterior genital operculum with about 30 (male) smooth setae arranged in two rows, that of female with about 20 setae, spermatheca as in fig. 101; entrance of genital chamber with 3 smooth setae on each side, half-sternites mostly with 6-8 posterior setae, III 3 suprastigmatal setae, IV 1 suprastigmal seta, XI 8 setae, coxal and sternal setae smooth and pointed; pleural membrane granulate. Chelicera (fig. 97): palm 6-8 smooth setae, galea 6 branches, serrula exterior 20-21 blades. Pedipalps (figs 98-99): trochanter, femur and patella granulate, hand indistinctly granulate; femur gradually enlarged from pedicel, slightly club-shaped, 3.6-3.8 times as long as broad, lateral setae slightly longer than medial ones and more clavate, patella 2.9-3.3 times, club 2.2-2.4 times as long as broad, setae dentate, hand finely granulate, lateral margin nearly straight, with pedicel 1.9-2.1 times as long as broad and 1.1 times longer than finger, 1.7-2.0 longer than hand breadth; chela with pedicel 3.4-3.9 times as long as broad; fingers not gaping, fixed finger with 58-67 marginal teeth, 6-10 external and 2-4 internal accessory teeth, movable finger with 62-72 marginal, 4-10 external and 1-2 internal accessory teeth. Trichobothria (fig. 100): *ist* normally slightly distad *est*, *st* normally half-way between *t* and *sb*, 3-4 sense-spots between *esb* and *est*, no sense-spots between *sb* and *st*, a small lanceolate seta near *st*; nodus ramosus proximad *t* and proximad *it*. Leg I: femur 1.8-1.9 times, patella 3.8-4.2 times as long as deep and 1.6-1.7 times longer than femur, tibia 5.5-6.3 times, tarsus 6.5-7.4 times; leg IV: femur +patella 4.9-5.4 times, tibia 7.4-8.7 times, tarsus with a short tactile seta in subdistal position (TS=0.66-0.73), 6.8-7.9 times as long as deep.



FIGS 97-106

97-101: *Spelaeochernes gracilipalpus* sp. n. ♀; 97: chelicera; 98-100: pedipalp; 101: spermatheca; 102-106: *Spelaeochernes pedroi* sp. n. ♀; 102: chelicera; 103-105: pedipalp; 106: spermatheca; scale unit 0.1mm.

Measurements (1♂ 6♀): Carapace 0.87-0.98/0.68-0.77 (♂: 0.82/0.68); Pedipalps: femur 0.90-0.95/0.24-0.25 (0.82/0.22), patella 0.87-0.91/0.27-0.29 (0.77/0.26), hand with pedicel 0.88-0.94/0.42-0.48 (0.80/0.41), finger length 0.81-0.86 (0.73), chelal length with pedicel 1.60-1.69 (1.42); Leg I: femur 0.27-0.30/0.15-0.17 (0.25/0.14), patella 0.46-0.50/0.11-0.12 (0.42/0.11), tibia 0.51-0.55/0.08-0.09 (0.48/0.08), tarsus 0.48-0.52/0.06-0.07 (0.47/0.06); Leg IV: femur+patella 0.82-0.88/0.16-0.17 (0.76/0.14), tibia 0.80-0.86/0.09-0.11 (0.74/0.09), tarsus 0.58-0.64/0.07-0.08 (0.54/0.07), length of tarsal tactile seta 0.10-0.13.

Etymology : named for its slender pedipalps

The male from Minas Gerais (Gruta dos Irmãos Pirá) is generally similar to the types, but is slightly smaller (length of palpal femur 0.76mm, chelal length 1.34mm) and has slightly stouter leg segments.

This species is distinguished from all other species of the genus by its elongate pedipalps (particularly the chela) and the smooth setae on the cheliceral palm.

Spelaeochernes pedrooi sp. n.

Figs 102-106

Material: Bahia, Gruta Milagrosa, Pau Brasil, Ig. B. Soares-Santos, 17.VII.1998: 1♂ (holotype) 4♀; same cave, Ig. E. Trajano, 3.VII.1997: 1♂ (MZUSP 15585); Gruta Califórnia, Pau Brasil, Ig. E. Trajano, 3.VII.1997: 2♂ 1♀; same cave, coll. B. Soares-Santos, 3.X.1997: 1♂ 2♀ 1T 3D (MZUSP 16590); same cave, Ig. E. Trajano, 28.X.1997: 1♀ (MZUSP 16589); Gruta Pedra Suspensa, Pau Brasil, Ig. E. Trajano, 2.VII.1997: 4♂ 1♀; Gruta Toca dos Moregos, Pau Brasil, Ig. E. Trajano, 22.IX.1997: 1♂ (MZUSP 16586); same cave, Ig. B. Soares-Santos, 10.II.1998: 1♀; Gruta dos Cristais I, Morro do Chapéu, in guano of frugivorous bats, Ig. L. Senna Horta, 10.IX.1994: 2♂ (paratypes).

Description: Carapace with two distinct, only slightly granulate, transverse furrows, subbasal one slightly nearer to posterior margin than to median furrow and curved backwards, coarsely granulate (with exception of a small central patch on both pro- and mesozone, which appears smooth), 4 + 1 smooth preocular seta at anterior, 6-8 at posterior border, 1.2-1.3 times as long as broad; tergites divided (except XI), anterior ones granulate, posterior ones (XI included) ctenoid-scaly, with 4-5 posterior setae, XI 8; palpal coxa distally granulate (with microsculpture), about 35 (1 tactile seta), coxa I 14-21, II 16-21, III 18-21, IV about 35; anterior genital operculum with about 35 (♂) smooth setae arranged in two rows, that of female with about 20 setae, spermatheca as in fig. 106; entrance of genital chamber 2-3 smooth setae on each side, half-sternites mostly with 5-6 posterior setae, III 3 suprastigmatal setae, IV 1 suprastigmal seta, XI 8-9, coxal and sternal setae smooth and pointed; pleural membrane with pointed granula. Chelicera (fig. 102): palm 6-7 setae (normally 2-3 dentate), galea 6 branches, serrula exterior 18-20 blades. Pedipalps (figs 103-104): trochanter, femur and patella coarsely granulate, femur gradually enlarged from pedicel, club-shaped, 3.2-3.6 times as long as broad, lateral setae slightly longer than medial ones and more clavate, patella 2.8-3.0 times, club 2.0-2.3 times as long as broad, hand finely granulate medially, with pedicel 1.6-1.7 (♂) or 1.7-1.9 (♀) times as long as broad and 1.0-1.3 times longer than finger, fingers slightly gaping in basal half, 1.42-1.59 (♂) or 1.49-1.76 (♀) longer than hand breadth; chela with pedicel 2.95-3.4 times as long as broad; fixed finger with 52-61 marginal teeth, 7-10 external and 2-4 internal accessory

teeth, movable finger with 57-68 marginal, 5-9 external and 2-4 internal accessory teeth. Trichobothria (fig. 105): *ist* and *est* at same level in middle of the finger, *it* slightly proximal to *et*, 3-4 sense-spots between *esb* and *est*, *st* halfway between *sb* and *t*, a slightly modified seta distal to *st*, 2 sense-spots between *sb* and *st*; nodus ramosus proximad *t* and *it*. Leg I: femur 1.6-1.8 times, patella 3.3-4.2 times as long as deep and 1.6-1.8 times longer than femur, tibia 5.4-6.7 times, tarsus 6.0-7.6 times; leg IV: lateral setae of femur and tibia clavate, femur+patella 4.3-5.2 times, tibia 6.5-8.2 times, tarsus with a slightly longer dentate seta in subdistal position (TS=0.68-0.76), 6.0-7.7 times as long as deep.

Measurements (8♂ 8♀): Carapace 0.84-1.00/0.67-0.82; Pedipalps: femur 0.85-1.03/0.24-0.30, patella 0.82-1.02/0.27-0.34, hand with pedicel 0.84-1.00/0.45-0.57, finger length 0.72-0.91, chelal length with pedicel 1.45-1.76; Leg I: femur 0.25-0.31/0.14-0.17, patella 0.42-0.52/0.11-0.14, tibia 0.47-0.59/0.08-0.10, tarsus 0.42-0.50/0.06-0.08; Leg IV: femur+patella 0.72-0.86/0.15-0.18, tibia 0.63-0.84/0.09-0.11, tarsus 0.50-0.59/0.07-0.09, length of tarsal tactile seta 0.11-0.13.

Etymology: named for Dr Pedro Gnaspi, renowned biospeleologist and collector of an important part of the present collection.

Spelaeochernes sp. (?*dentatus*)

Material: São Paulo, Gruta do Zé Maneco, Fazenda Intervales, Iporanga, Ig. P. Gnaspi Netto, 25.III.1988: 2T 1D (MZUSP 10291); Caverna da Aegla, Fazenda Intervales, Iporanga, in haematophagous bat guano, Ig. E. Trajano & P. Gnaspi, 11.VII.1990: 1T (MZUSP 13804); Minas Gerais, Gruta Paredão da Fenda III, Matozinhos, Ig. L. Senna Horta, 20.XII.1995: 1T. Mato Grosso do Sul, Gruta Nossa Senhora Aparecida, Bonito, Ig. E. Trajano & P. Gnaspi, 16.X.1990: 2T (MZUSP 13792).

DISCUSSION: The eight new species of *Spelaeochernes* may be placed in two groups, according to the shape of the pedipalpal femur: either abruptly (*eleonorae* and *altamirae*) or gradually enlarged from the pedicel (*dentatus* and all other species). Within the latter group, two lineages may be defined: a) species showing sexual dimorphism, the male having more or less developed protuberances on the chelal hand (*dentatus* and *armatus*) (Paraná, Santa Catarina, São Paulo); b) species with more or less gaping chelal fingers (*bahiensis* and *pedrooi*) (Bahia). The species *dubius* and *gracilipalpus* might belong to the first lineage (the sexual dimorphism shows individual variation!), with a more restricted distribution than *dentatus*. However, the distribution pattern of this genus remains to be defined. The surprising diversity of this genus and some aspects of the geographical distribution of its species might also be considered in relation to phoresy and bat migration, which could be responsible for their dispersal. Unfortunately, nothing seems to be known about the possible migration of the different bat colonies inhabiting the caves. It would not be surprising if collecting in yet unexplored caves yielded even more species of this genus, and the analysis of this species flock by non-morphological methods will perhaps contribute to a better comprehension of their radiation and current distribution.

All species seem to occur regularly in caves in association with bat guano, probably being guanophiles/troglophiles, following Gnaspi's (1992) definition. On

the other hand, species of this genus might show ecological features similar to those of species of *Lasiochernes* Beier or *Nudochernes* Beier which are found in subterranean mammal nests, but also in caves (normally associated to bat guano). Brief sampling of epigean habitats near the entrance of the Gruto dos Paiva (Iporanga) yielded species of *Lustrochernes*, *Ideoroncus* and representatives of Dithidae, but no species of *Spelaeochernes*. However, our knowledge of the epigean pseudoscorpion fauna is much too fragmentary to allow any clear conclusions.

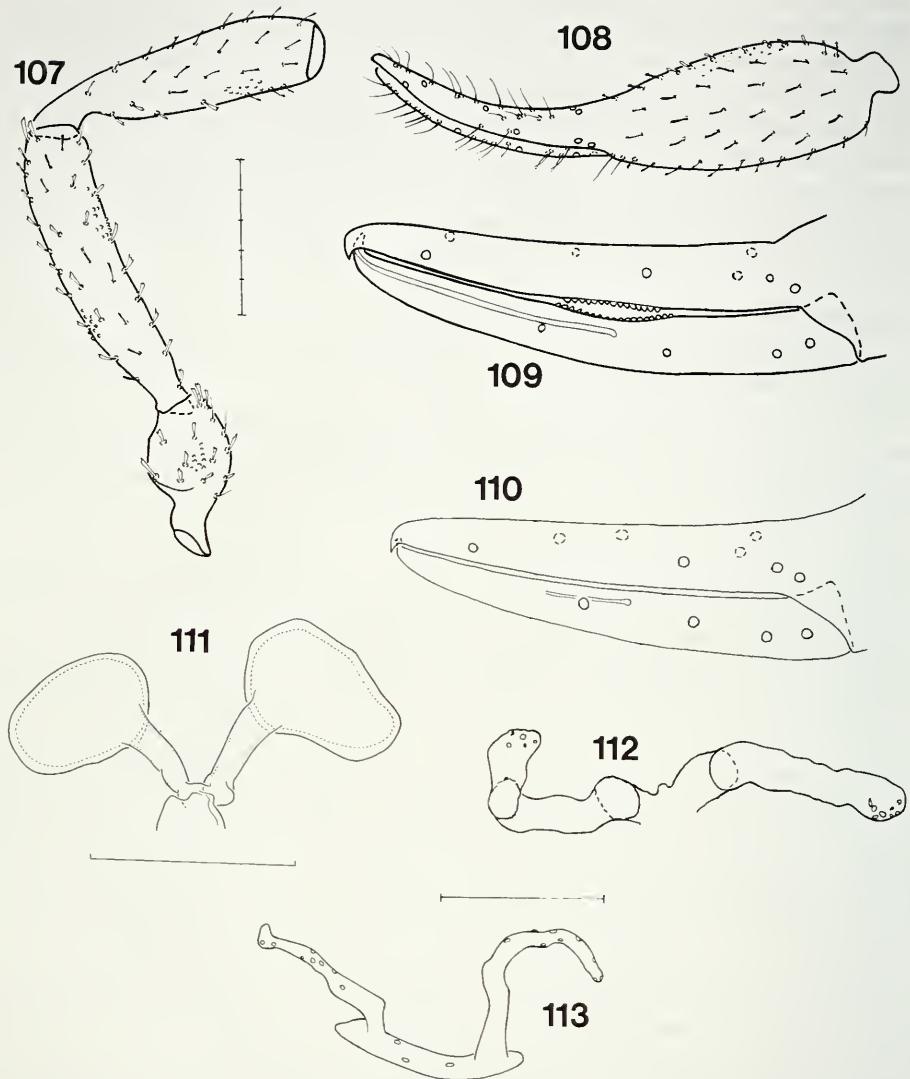
On the other hand, several insufficiently known species currently placed in the genera *Neochelanops* or *Dinocheirus* might belong to the new genus.

Zaona cavicola sp. n.

Figs 107-109

Material: Mato Grosso do Sul, Caverna Santa Maria, Jardim, Ig. E. Trajano & P. Gnaspini, 20. VII.1991: 1♂ (holotype) (MZUSP 13795).

Description: Carapace with two distinct transverse granulate furrows, subbasal one curved forwards and closer to posterior margin than to median furrow, no eye-spots, coarsely granulate, 4-6 + 1 dentate preocular seta at anterior, 6 at posterior border, setae dentate and clearly clavate, 1.1 times as long as broad; tergites indistinctly divided, XI undivided, anterior ones granulate, posterior ones (XI included) ctenoid-scaly, 2/3/23/3-4/4-5/3/3-4/4/3-4/3 setae on posterior margin, XI 6 (2 median discal setae); setae clearly clavate; anterior lobe of palpal coxa 3 marginal and 1 discal setae, palpal coxa granulate, about 23 (1 tactile seta and 2 clavate setae), coxa I 10, II 13, III 14, IV 20; anterior genital operculum with about 36 smooth setae arranged in several rows (interior setae much longer); entrance of genital chamber with 3 smooth setae on each side; chaetotaxy of half-sternites: 4/4/6/5/3/4/4/3-4/, III 2 suprastigmatal setae, IV 1 suprastigmatal seta, VII-IX with one medial anterior seta, XI 4 setae (2 short lateral tactile setae), coxal and sternal setae smooth and pointed; anal cone 2 ventral and 2 dorsal smooth setae. Pleural membrane granulate. Chelicera: palm 6 setae (*ib* dentate), fixed finger with 3 large and 3 small teeth, movable finger with a small, pointed, marginal tooth and small subapical lobe, galea 6 branches, serrula exterior 19 blades, flagellum 3 setae (first one dentate). Pedipalps (figs 107-108) elongate, *Chelifer*-like, coarsely granulate: trochanter, with broad, rounded dorsal hump; femur 4.7 times as long as broad, patella 4.2 times, club 3.2 times as long as broad, hand with pedicel 2.6 times as long as broad and 1.1 times longer than finger; chela with pedicel 4.6 times as long as broad; fingers gaping in the middle, fixed finger with 65 marginal teeth, 4 external and 3 internal accessory teeth, movable finger with 68 marginal, 6 external and 1 internal accessory teeth. Trichobothria (fig. 109): no "guard seta" near *ist*, *ist* clearly distad *est* and half-way between *isb* and *it*, *est* in proximal half and nearer *ist* than *esb*, *st* half-way between *t* and *sb*, 4 sense-spots distad *est*, two sense-spots near *sb*; nodus ramosus half-way between *st* and *t*. Leg I: femur 2.0 times, patella 4.0 times as long as deep and 1.7 times longer than femur, tibia 6.2 times, tarsus 6.8 times; leg IV: femur+patella 4.6 times, tibia 6.9 times, tarsus 7.0 times as long as deep, no tactile seta, claws smooth.



FIGS 107-113

107-109: *Zaona cavicola* sp. n. ♂, pedipalp; 110-111: *Rhopalochernes ohausi* (Tullgren) ♀ syntype (Mus. Hamburg no. 260). 110: trichobothrial pattern; 111: spermatheca (del. M. Judson); 112: *Chelanops coecus* (Gervais), spermatheca (Chile, Aysen, det. M. Beier 1963); 113: *Neochelanops patagonicus* (Tullgren), spermatheca (Argentina, Rio Negro, El Bolson; det. M. Beier 1963); scale unit 0.1mm.

Measurements: Carapace 0.93/0.85; Pedipalps: femur 1.04/0.22, patella 1.00/0.24, hand with pedicel 0.95/0.37, finger length 0.86, chelal length with pedicel 1.72; leg I : femur 0.31/0.16, patella 0.54/0.14, tibia 0.58/0.09, tarsus 0.49/0.07; leg IV: femur+patella 0.87/0.19, tibia 0.81/0.12, tarsus 0.59/0.08.

In the absence of the female (and hence in ignorance of the shape of spermatheca) there are apparently no generic characters separating the new species from *biseriatum*, the type species of the previously monotypic genus *Zaona* from Florida. The two species share a flagellum of 3 setae, a nearly identical trichobothrial pattern, elongate *Chelifer*-like pedipalps, the absence of a distinct, long tactile seta on tarsus IV and no tactile setae on tergite XI. They have similar measurements and proportions of pedipalps, but differ in following characters: *cavicola* sp. n. has no *Parachernes*-type "keel" on carapace, a more elongate pedipalpal patella (4.2 times versus 3.5-3.9 times), more numerous teeth on the chelal fingers (65/68 versus 44/51), clearly gaping fingers and leg IV much more elongate (*biseriatum*: tibia 4.8-4.9 times, tarsus 4.8-5.2). Furthermore, *cavicola* has a more slender cheliceral galea and fewer tergal setae (3-4 versus 6-7). The genus *Macrochernes* Hoff also has three blades on the flagellum and a similar trichobothrial pattern, but is characterized by the presence of a long tarsal tactile seta and a keel-like eminence on posterior margin of carapace (Muchmore, 1969).

Hopefully supplementary specimens will be collected, particularly females, which should confirm or refute the generic position of this new species.

Maxchernes iporangae Mahnert & Andrade, 1998

Material: São Paulo, Caverna Alambari de Baixo, Iporanga, in frugivorous bat guano, lg. E. Trajano & P. Gaspini, 17.VI.1990 (MZUSP 13818): 4♂ 3♂ 1♀ (GE 2♂ 2♀).

These supplementary specimens have been collected in the type locality.

KEY TO ADULT CHERNETIDAE COLLECTED IN BRAZILIAN CAVES

- | | | |
|----|---|---|
| 1 | Flagellum of 4 blades | 2 |
| 1° | Flagellum of 3 blades; large species with slender pedipalps (femur ratio 4.7, length 1.04mm, patella ratio 4.2, length 1.00 mm, chela ratio 4.6, length 1.72 mm); fingers gaping in middle over a short distance; <i>ist</i> distal to <i>est</i> , only a little nearer <i>est</i> than <i>it</i> ; no tactile seta on tarsus IV.- Mato Grosso do Sul. | <i>Zaona cavicola</i> sp. n. |
| 2 | Larger species, length of palpal femur at least 0.7 mm; tergite XI with two tactile setae; spermatheca with two, short, thick prolongations; a short (pseudo-)tactile seta on tarsus IV: genus <i>Spelaeochernes</i> gen. n. | 3 |
| 2° | Small species, length of palpal femur at most 0.64 mm; tarsus IV without tactile seta; tergite XI without tactile setae; spermatheca with two relatively long tubules | <i>Maxchernes iporangae</i> Mahnert & Andrade |
| 3 | Galea with 6 branches in both sexes | 4 |
| 3° | Galea with 8-10 branches in both sexes; large species (length of palpal femur at least 1.00 mm, chelal length 1.74mm); ventrobasal corner of | |

- chelal hand with a setose patch in both sexes, chelal hand of male dorsodistally with a large anteriad-directed protuberance. - Santa Catarina. *Spelaeochernes armatus* sp. n.
- 4 Pedipalpal femur abruptly enlarged from pedicel laterally, thereafter parallel-sided. 5
- 4° Pedipalpal femur gradually enlarged from pedicel laterally, club-shaped. 6
- 5 Pedipalps stout, femur 2.7-3.1 times, patella 2.3-2.7 times, chela 2.7-3.2 times longer than broad; 2-4 internal accessory teeth on movable chelal finger. - São Paulo, Goias, Minas Gerais, Mato Grosso do Sul
..... *Spelaeochernes eleonorae* sp. n.
- 5° Pedipalps slender, femur at least 3.6 times, patella at least 2.9 times, chela at least 3.4 times longer than broad; internal accessory teeth absent on movable chelal finger. - Pará *Spelaeochernes altamirae* sp. n.
- 6 Chelal fingers not gaping 8
- 6° Chelal fingers gaping, movable chelal finger in middle more or less distinctly curved. - Bahia 7
- 7 Pedipalpal femur of male 3.1-3.3 times, of female 3.4-3.5 times, patella of male 2.5-2.7 times, of female 2.8-2.9 times longer than broad; 45-51 teeth on fixed chelal finger, 48-57 on movable finger; length of tactile seta on tarsus IV 0.08-0.10mm *Spelaeochernes bahiensis* sp. n.
- 7° Pedipalpal femur of male 3.3-3.7 times, of female 3.2-3.6 times, patella of both sexes 2.8-3.0 times longer than broad; 52-61 teeth on fixed finger, 57-68 teeth on movable finger; length of tactile seta on tarsus IV 0.11-0.13mm *Spelaeochernes pedrooi* sp. n.
- 8 At least 1-2 setae of cheliceral palm (out of 5-7) dentate; pedipalpal femur at most 3.6 times, patella 3.0 times, chela at most 3.5 times longer than broad 9
- 8° All setae of cheliceral palm (6-8) smooth; pedipalpal femur 3.6-3.8 times, patella 2.9-3.2 times, chela 3.4-3.9 times longer than broad; femur length 0.76-0.82mm (♂)/0.90-0.95mm (♀). - São Paulo, Minas Gerais (?). *Spelaeochernes gracilipalpus* sp. n.
- 9 Larger species, length of palpal femur 0.91-1.17mm, of patella 0.91-1.18mm, of chela with pedicel 1.64-2.02mm; hand of larger males with a more or less distinct hump or angle on medial side near finger base. - Paraná, São Paulo. *Spelaeochernes dentatus* sp. n.
- 9° Smaller species, length of palpal femur 0.71-1.02mm, of patella 0.69-0.93mm, of chela with pedicel 1.30-1.83mm; hand of males without hump or angle on medial side of hand. - São Paulo, Minas Gerais, Mato Grosso do Sul. *Spelaeochernes dubius* sp. n.

(*Dinocheirus uruguayanus* Beier, 1970 (Uruguay, Gruta de Arequita, Lavalleja) might belong to this genus and could be related to *eleonorae* n.sp., judging by the shape of palpal femur, but differs from it by the presence of only dentate setae on tergite XI and the position of trichobothrium *1st* clearly proximal of *st*, *st* being quite close to *t*.)

CONCLUDING REMARKS

The diversity of cave inhabiting pseudoscorpions in Brazil is quite high, with 25 species now recorded from more than a hundred caves of the different karst areas in Brazil, but this number is certainly not definitive. It is quite surprising that representatives of some genera quite common in these areas have not yet been found in these collections, e.g. the chthoniid *Tyrannochthonius* (common in the Amazon region; cavernicolous species known from different regions of the world) or the chernetids *Lustrochernes* or *Cordylochernes* (recorded from caves in Peru or Ecuador). Except for some fortuitous findings of representatives of Lechytiidae (*Lechytiella chthoniformis*) and Tridenchthoniidae (*Cryptoditha* cf. *elegans*), these are also generally lacking, despite the fact that these genera are very common in the epigean habitats of these regions (unpublished results). This absence might be explained by ecological factors (as suggested by Trajano & Gaspini-Netto, 1991) or simply by the difficulty in collecting them in caves, due to their small size. The known diversity of the Ideoroncidae (*Ideoroncus* and *Albiorix*) (Mahnert, 1984) and Olpiidae (*Progarypus* and other genera?) suggest that more epigean and troglophilous species will be discovered.

The present results do, however, allow a preliminary biogeographical analysis, which confirms results obtained for other animal groups. We can recognize roughly three faunal districts, each characterized by at least one pseudoscorpion genus.

- a) Altamira-Itaituba karst region (Pará): in the caves of this region, Amazonian elements prevail, with *Nannobisium beieri* (a widely distributed epigean syarinid species) and a well defined species of *Spelaeochernes*;
- b) the species found in Bahia caves (subregion Médio São Francisco of the Bambuí karst region) are well defined (*Spelaeochernes bahiensis* and *pedroi*) and present partial affinities with the Amazonian fauna (e.g. *Pseudochthonius gracilimanus* sp. n., apparently related to the widespread *P. orthodactylus* Muchmore; *Spelaeobochica alludentatus* gen.n.sp. n. with the nearest representatives of the family known from Venezuela and the Caribbean region). Some other taxa (e.g. of the genera *Progarypus* and *Cheiridium*) emphasize connections with the subtropical fauna, being well represented in the karst regions of Ribeira Valley and Bambuí.
- c) the caves in the south-western parts of the country (São Paulo, Mato Grosso do Sul, etc.) have been colonized by genera that predominate in this subtropical region, e.g. *Ideoroncus* (two species), *Progarypus* (four species) and *Maxchernes* (one species), as well as by the cave-restricted genus *Spelaeochernes* (five species), and the surprising occurrence of *Zaona*. *Spelaeochernes dentatus* and *armatus* are probably a species pair typical of the Vale do Ribeira province.

LIST OF CAVES WITH PSEUDOSCORPIONS

BAHIA STATE

BA-001: Gruta (Lapa) dos Brejões, Morro do Chapéu/Irecê; alt. 600m; 11°00'30"S/ 41°26'07"W: *Progarypus liliae* sp. n.

- BA-009: Gruta do Impossível, Palmeiras; alt. 650m; $10^{\circ}12'52''S/41^{\circ}04'10''W$: *Spelaeobochica allobentatus* n.gen.sp.; *Pseudochthonius gracilimannus* sp. n.
- BA-018: Gruta dos Cristais I, Morro do Chapéu: *Spelaeochernes pedroi* sp. n.; *Cheiridium brasiliense* sp. n.
- BA-069: Gruta Azul, near Fazenda Pratinha, Iraquara; alt. 660m; $12^{\circ}20'52''S/41^{\circ}32'33''W$: *Pseudochthonius gracilimannus* sp. n.
- BA-072: Gruta Lapa II (Santa Rita cave system), Iraquara, proximo Vila Santa Rita; alt. 630m; $12^{\circ}20'02''S/41^{\circ}36'00''W$: *Spelaeochernes bahiensis* sp. n.; *Pseudochthonius gracilimannus* Mahnert (D).
- BA: Gruta Lapa Doce II, Iraquara: *Spelaeochernes bahiensis* sp. n.
- BA-BOD: Gruta do Bode, Itaetê, $12^{\circ}56'S/41^{\circ}04'W$: *Spelaeochernes bahiensis* sp. n.
- BA-POC: Gruto do Poço Encantando, Itaetê, $12^{\circ}57'S/41^{\circ}06'W$: *Spelaeochernes bahiensis* sp. n.
- BA: Gruta da Gameleira, Campo Formoso: *Spelaeochernes bahiensis* sp. n.
- BA: Gruta Califórnia, Pau Brasil: *Spelaeochernes pedroi* sp. n.
- BA: Gruta Milagrosa, Pau Brasil: *Spelaeochernes pedroi* sp. n.
- BA: Gruta Pedra Suspensa, Pau Brasil: *Spelaeochernes pedroi* sp. n.
- BA: Gruta Toca dos Morcegos, Pau Brasil: *Spelaeochernes pedroi* sp. n.

GOIÁS STATE

- GO-018: Gruta dos Ecos, Corumbá de Goiás, $15^{\circ}38'00''S/48^{\circ}15'20''W$, alt. 1050m: *Spelaeochernes eleonorae* sp. n.
- GO-066: Gruta Qualquer Coisa, Padre Bernardo, alt. 361m: *Spelaeochernes eleonorae* sp. n.

MINAS GERAIS STATE

- MG-024: Gruta do Baú, Pedro Leopoldo, Distrito Fidalgo, $19^{\circ}33'12''S/43^{\circ}59'24''W$, alt. 740m: *Progarypus gracilis* sp. n.
- MG-032: Gruta Bonita, Fazenda Janelao, Januária, $15^{\circ}06'23''S/44^{\circ}14'20''W$, alt. 630m: *Progarypus* sp. (T)
- MG-123: Lapa dos Desenhos, Itacarambi, $15^{\circ}06'35''S/44^{\circ}13'58''W$, alt. 700m: *Progarypus setifer* sp. n.
- MG-125: Gruta da Dobra, Lagoa Santa, near Gruta da Lapinha, $19^{\circ}33'27''S/43^{\circ}57'26''W$, alt. 730m: *Spelaeochernes eleonorae* sp. n.
- MG-199: Gruta do Janelão, Januária/Itacarambi, $15^{\circ}06'54''S/44^{\circ}14'27''W$, alt. 600m: *Progarypus setifer* sp. n.
- MG-200: Gruta Jean Louis, Sete Lagoas, Fazenda da Lapa, $19^{\circ}26'59''S/44^{\circ}17'14''W$, alt. 900m: *Spelaeochernes* sp. (*eleonorae* n.sp.?)
- MG-215: Gruta do Lameiro, Matozinhos, $19^{\circ}28'13''S/44^{\circ}03'43''W$: *Cryptoditha* cf. *elegans* (Beier)
- MG-219: Gruta da Lapinha, Lagoa Santa, $19^{\circ}33'40''S/43^{\circ}57'30''W$, alt. 730m: *Progarypus gracilis* sp. n.
- MG-288: Gruta Olhos d'Água, Itacarambi, $15^{\circ}06'47''S/44^{\circ}10'11''W$, alt. 500m: *Pseudochthonius biseriatns* sp. n.

- MG-297: Lapa das Pacas, Lagoa Santa, 19°33'32"S/43°58'00"W, alt. 670m: *Spelaeochernes eleonorae* sp. n.
- MG-396: Gruta Tamboril, Unaí, 16°19'24"S/46°59'02"W, alt. 670m: *Pseudochthonius cf. ricardoi* n.sp.; *Spelaeochernes eleonorae* sp. n.
- MG-426: Lapa Vermelha I, Pedro Leopoldo, Fazenda Lapa Vermelha, 19°36'42"S/43°59'44"W, alt. 760m: *Pseudochthonius strinatii* Beier, *Spelaeochernes eleonorae* sp. n.
- MG-474: Gruta do Intoxicado, Pedro Leopoldo, 19°32'47"S/43°58'44"W: *Spelaeochernes dubius* sp. n.
- MG-625: Gruta do Labirinto Fechado, Lagoa Santa, 19°33'09"S/43°56'59"W: *Progarypus gracilis* sp. n.
- MG-657: Gruta Paredão da Fenda III, Matozinhos, 19°28'38"S/44°02'21"W: *Spelaeochernes* sp.
- MG-720: Gruta Corrego do Capão, Capim Branco, Usiferro, 19°33'01"S/44°06'52"W, alt. 810m: *Spelaeochernes dubius* sp. n.
- MG-825: Gruta Periperi I, Matozinhos, Dolina Sacota-Minerv. Maua, 19°31'59"S/44°03'49"W: *Progarypus gracilis* sp. n.
- MG: Gruta dos Irmãos Piría, Matozinhos: *Spelaeochernes gracilipalpus* Mahnert
- MG: Buraco (=Lapa) do Medo, Sete Lagoas: *Spelaeochernes dubius* sp. n., *Pseudochthonius strinatii* Beier

MATO GROSSO DO SUL STATE

- MS-002: Gruta Lago Azul, Bonito, alt. 450m: *Spelaeochernes dubius* sp. n.
- MS-003: Gruta Nossa Senhora Aparecida, Bonito, alt. 440m: *Spelaeochernes* sp. (T)
- MS-009: Gruta da Sao Miguel (= Carneira), Bonito: *Spelaeochernes eleonorae* sp. n.
- MS-012: Gruta do Mimoso, Bonito, alt. 440m: *Spelaeochernes eleonorae* sp. n. (T)
- MS-013: Gruta do Ametista, Bonito: *Spelaeochernes eleonorae* sp. n.
- MS-014: Gruta João Arruda, Bonito, alt. 360m: *Spelaeochernes eleonorae* sp. n.
- MS-015: Gruta do Curé, Fazenda Santa Maria, Bonito, alt. 290m: *Lechytiachthoniiiformis* (Balzan); *Spelaeochernes eleonorae* sp. n.
- MS-016: Abismo do Poço, Fazenda Santa Maria, Jardim, 21°26'00"S/56°27'10"W: *Spelaeochernes eleonorae* sp. n.
- MS-025: Caverna Santa Maria, Fazenda Santa Maria, Jardim; 21°25'50"S/56°27'10"W: *Spelaeochernes eleonorae* sp. n.; *Zaona cavicola* sp. n.
- MS-027: Gruta de X-Coqueiro, Fazenda Santa Maria, Jardim, 21°26'00"A/56°27'10"W: *Spelaeochernes eleonorae* sp. n.
- MS-028: Gruta Vale do Prata, Fazenda Vale Prata, Bonito, 21°25'50"S/56°28'10"W: *Spelaeochernes eleonorae* sp. n.
- MS-029: Gruta Dona Matilde, Bonito: *Spelaeochernes eleonorae* sp. n.
- MS-031: Gruta do Guaviral, Bonito, 21°08'20"S/56°35'40"W: *Spelaeochernes eleonorae* sp. n.
- MS-034: Gruta Harmonia, Bonito: *Spelaeochernes dubius* sp. n.
- MS-038: Gruta Pitangueiras, Bonito: *Spelaeochernes dubius* sp. n.

PARÁ STATE

- PA-021: Caverna Pedra da Cachoeira (sandstone cave), Altamira, $03^{\circ}18'43''S/52^{\circ}20'28''W$, alt. 158m: *Nannobisium beieri* Mahnert
- PA-024: Caverna Planáltina (sandstone cave), Medicilândia, $03^{\circ}22'30''S/52^{\circ}34'18''W$, alt. 170m: *Spelaeochernes altamirae* sp. n.
- PA-033: Caverna do Limoeiro (sandstone cave), Medicilândia, $03^{\circ}32'20''S/52^{\circ}47'07''W$, alt. 250m : *Spelaeochernes altamirae* sp. n.

PARANA STATE

- PR-006: Gruta da Lacinha, Rio Branco do Sul, $25^{\circ}09'58''S/49^{\circ}17'12''W$, alt. 880m: *Ideoroncus cavicola* n.sp.; *Spelaeochernes dentatus* sp. n.
- PR-014: Gruta da Toca, Rio Branco do Sul, $25^{\circ}10'38''S/49^{\circ}18'16''W$, alt. 900m: *Spelaeochernes dentatus* sp. n.
- PR-015: Gruta de Terra Boa, Almirante Tamandaré, $25^{\circ}12'58''S/49^{\circ}31'23''W$, alt. 667m: *Spelaeochernes dentatus* sp. n.
- PR-016: Gruta de Água Boa, Almirante Tamandaré, $25^{\circ}16'45''S/49^{\circ}21'30''W$, alt. 980m: *Spelaeochernes dentatus* sp. n.
- PR-020: Gruta de Toquinhas, Rio Branco do Sul, $25^{\circ}09'56''S/49^{\circ}18'05''W$, alt. 910m: *Spelaeochernes dentatus* sp. n.
- PR-050: Gruta de Olhos d'Agua, Castro, $25^{\circ}01'23''S/49^{\circ}47'30''W$, alt. 750m: *Spelaeochernes dentatus* sp. n.
- PR-058: Gruta Morro de Pedra, Guaraqueçaba, $25^{\circ}08'10''S/48^{\circ}17'18''W$, alt. 300m: *Spelaeochernes dentatus* sp. n.
- PR-106: Gruta do Rocha, Adrianópolis, $24^{\circ}44'50''S/49^{\circ}06'40''W$, alt. 330m: *Spelaeochernes dentatus* sp. n.; *Pseudochthonius strinatii* Beier (T)
- PR-108: Gruta Ermida Paiol do Alto, Adrianópolis, $24^{\circ}43'13''S/49^{\circ}04'58''W$, alt. 700m: *Spelaeochernes dentatus* sp. n.
- PR-118: Gruta do Bom Sucesso, Cerro Azul, $24^{\circ}48'06''S/49^{\circ}12'40''W$, alt. 305m: *Spelaeochernes dentatus* sp. n.
- PR-123: Ermida do Paiol de Capim, Cerro Azul, $24^{\circ}44'18''S/49^{\circ}07'06''W$, alt. 640m: *Spelaeochernes dentatus* sp. n.
- PR-137: Ermida do Maciel, Tijuco Alto-Morro do Pote, Adrianópolis, $24^{\circ}45'08''S/49^{\circ}05'46''W$, alt. 680m: *Spelaeochernes dentatus* sp. n.

SÃO PAULO STATE:

- SP-002: Gruta da Tapagem (= do Diabo), Eldorado Paulista, Jacupiranga region, $24^{\circ}38'12''S/48^{\circ}23'50''W$, alt. 380m: *Spelaeochernes dentatus* sp. n.; *Pseudochthonius strinatii* Beier
- SP-004: Gruta da Arataca, Espírito-Santo region, Iporanga, $24^{\circ}27'23''S/48^{\circ}35'22''W$, alt. 482m: *Spelaeochernes gracilipalpus* sp. n. (T)
- SP-009: Gruta Casa de Pedra, Iporanga, $24^{\circ}28'46''S/48^{\circ}35'23''W$, alt. 270m: *Ideoroncus setosus* Mahnert: *Spelaeochernes dentatus* sp. n.
- SP-010: Caverna da Pescaria, Espírito-Santo region, Apiaí, $24^{\circ}24'13''S/48^{\circ}33'01''W$, alt. 280m: *Spelaeochernes dentatus* sp. n.

- SP-012: Caverna Alambari de Baixo, Iporanga, 24°33'15"S/48°39'55"W, alt. 196m: *Maxchernes iporanga* Mahnert & Andres; *Ideoroncus cavicola* sp. n.
- SP-013: Gruta do Chapéu, Espírito-Santo region, Iporanga, 24°25'53"S/48°35'20"W, alt. 610m: *Spelaeochernes gracilipalpus* sp. n.
- SP-018(019): Gruta das Areias de Cima (Areias I), Iporanga, 24°35'20"S/ 48°42'05"W, alt 205m: *Ideoroncus cavicola* sp. n.; *Pseudochthonius strinatii* Beier
- SP-021(022): Gruta do Morro Preto, Iporanga, 24°31'50"S/48°41'59"W: *Pseudochthonius strinatii* Beier; *Spelaeochernes dentatus* sp. n.
- SP-025: Gruta da Água Suja, Iporanga, 24°33'12"S/48°42'27"W, alt. 280m: *Pseudochthonius ricardoi* sp. n.
- SP-026: Caverna Córrego Grande I, Iporanga, 24°31'03"S/48°42'47"W, alt. 300m: *Spelaeochernes dentatus* sp. n.
- SP-041: Caverna Santana, Iporanga, 24°31'51"S/48°42'06"W, alt. 250m: *Progarypus nigrimanus* sp. n.
- SP-042: Gruta dos Paiva, Fazenda Intervales, Iporanga, 24°16'24"S/48°26'32"W, alt. 780m: *Spelaeochernes gracilipalpus* sp. n.
- SP-043: Gruta da Figueira, Fazenda Intervales, Iporanga, 24°19'13"S/48°27'45"W, alt. 625m : *Spelaeochernes dentatus* sp. n.
- SP-047: Gruta Bethary de Baixo (=Gruta do Betari), Iporanga, 24°34'34"S/ 48°37'39"W, alt. 125m: *Spelaeochernes dentatus* sp. n.
- SP-061: Gruta Temimina II, Espírito-Santo region, Iporanga, 24°23'05"S/48°34'08W, alt. 490m: *Spelaeochernes gracilipalpus* sp. n.
- SP-072: Gruta do Espírito-Santo, Espírito-Santo region, Iporanga, 24°26'33"S/ 48°37'02"W: *Spelaeochernes dentatus* sp. n.
- SP-095: Gruta da Toca (sandstone cave), Serra Geral region, Analândia: *Spelaeochernes dubius* sp. n.
- SP-170: Gruta do Fazendão (sandstone cave), Serra Geral region, Ipeúna, 22°24'37"S/ 47°47'34"W, alt. 810m: *Spelaeochernes dubius* sp. n.
- SP-180(181?): Gruta Sertãozinho (sandstone cave), Altinópolis, 21°03'54"S/47°26'00"W, alt. 660m: *Spelaeochernes eleonorae* sp. n.
- SP-200: Gruta do Jair, Fazenda Intervales, Iporanga, 24°27'47"S/48°36'21"W: *Spelaeochernes dentatus* sp. n.(T)
- SP-210: Gruta da Aegla, Fazenda Intervales, Iporanga, 24°19'09"S/48°27'37"W, alt. 605m: *Spelaeochernes* sp. (T)
- SP-211: Gruta do Zé Maneco, Fazenda Intervales, Iporanga, 24°17'54"S/ 48°26'36"W, alt. 735m: *Spelaeochernes* sp. (T)
- SP-233: Gruta do Tatu, Fazenda Intervales, Iporanga, 24°16'05"S/48°25'03"W, alt. 815m: *Spelaeochernes dentatus* sp. n.
- SP-235: Toca dos Meninos, Fazenda Intervales, Ribeirão Grande, 24°15'47"S/ 48°24'58"W, alt. 870m: *Spelaeochernes dentatus* sp. n.
- SP-237: Gruta Jane Mansfield, Fazenda Intervales, Iporanga, 24°15'50"S/48°26'42W, alt. 880m: *Spelaeochernes gracilipalpus* sp. n.
- SP-241: Gruta do Bocão, Fazenda Intervales, Iporanga, 24°16'11"S/48°26'43"W, alt. 810m: *Spelaeochernes dubius* sp. n.

- SP-246: Gruta do Fóssil Desconhecido, Fazenda Intervales, Iporanga, 24°16'04"S/ 48°25'03"W, alt. 820m: *Spelaeochernes gracilipalpus* sp. n.
- SP-247: Gruta do Minotauro, Fazenda Intervales, Iporanga, 24°16'22"S/48°27'22"W, alt. 890m: *Spelaeochernes gracilipalpus* sp. n.(T)
- SP-248: Caverna do Tufo, Iporanga, Fazenda Intervales, Figueira, 24°19'35"S/ 48°28'02"W, alt. 515m: *Spelaeochernes dentatus* sp. n.
- SP-261: Gruta da Cabeça de Paca, Fazenda Intervales, Iporanga, 24°16'01"S/ 48°27'15"W, alt. 885m: *Spelaeochernes gracilipalpus* sp. n.
- SP-271: Gruta do Moquem, Fazenda Intervales, Iporanga, 24°18'35"S/48°27'20"W, alt. 725m: *Cryptoditha* sp. (T); *Spelaeochernes dentatus* sp. n.
- SP-309(310): Gruta Sítio das Cavernas, Fazenda Intervales, Ribeirão Grande, 24°40'50"S/48°25'05"W, alt. 870m: *Spelaeochernes dentatus* sp. n.
- SP-318: Gruta do Rio Preto, Fazenda Intervales, Guapiara, 24°14'19"S/48°27'04"W, alt. 860m: *Spelaeochernes dentatus* sp. n.
- SP-322: Gruta dos Pianos, Fazenda Intervales, Guapiara, 24°15'45"S/48°28'55"W, alt. 860m: *Spelaeochernes dentatus* sp. n.
- SP: Gruta Vista da Cachoeira (sandstone cave), Serra Geral region, Ipeúna.: *Spelaeochernes dubius* sp. n.
- SP: Caverna do Grotão, Ribeira: *Spelaeochernes dentatus* sp. n.

SANTA CATARINA STATE:

- SC: Gruta Botuverá, Botuverá: *Spelaeochernes armatus* sp. n.
- SC: Gruta Botuverá II, Botuverá: *Spelaeochernes armatus* sp. n.

ACKNOWLEDGEMENTS

I express my sincere thanks to Dra Eleonora Trajano (Sao Paulo) for her patience and unfailing confidence, as well as for her hospitality during the Workshop on soil arthropods, with emphasis on cave taxa (August 1998) at the Instituto de Biociências/USP (FAPESP no. 98/005087-5). It is a pleasure to thank Dr. Pedro Gnaspi, Dr. Ricardo Pinto-da-Rocha, Dr. José Luiz Moreira Leme and all the collectors for their patience and understanding. I also thank Dr. Adriano B. Kury (Rio de Janeiro) for the loan of type specimens of *Geogarypus itapeimirinensis* Feio, Dr. William B. Muchmore (Rochester) for the loan of specimens of *Zaona biseriatum*, together with his notes and comments on this species, and Dr. H. Dastych (Zool. Museum Hamburg) for the loan of the type specimens of *Rhopalochernes ohausi* (Tullgren). Sincere thanks are due to Dr. Mark Judson (Muséum national d'Histoire naturelle, Paris) for his criticism, offering unpublished observations and linguistic improvement of the manuscript.

BIBLIOGRAPHY

- ADIS, J. & HARVEY, M. S. 2000. How many Arachnida and Myriapoda are there world-wide and in Amazonia? *Studies of the Neotropical Fauna & Environment* 35: 139-141.
- AGUIAR, N. O. & BÜHRNHEIM, P. F. 1992. Pseudoscorpiones foréticos de *Stenodontes spinibarbis* (Lin., 1758) (Coleoptera) et redescrifção de *Lechytiella chthoniiformis* (Balzan, 1890) (Pseudoscorpiones, Chthoniidae) da Ilha de Maraca-Roraima. *Acta amazonica* 21: 425-433.
- BEIER, M. 1955. Pseudoscorpionidea, gesammelt während der schwedischen Expeditionen nach Ostafrika 1937-38 und 1948. *Arkiv för Zoologi* 7(25): 527-558.
- BEIER, M. 1959. Zur Kenntnis der Pseudoscorpioniden-Fauna des Andengebietes. *Beiträge zur neotropischen Fauna* 1: 185-228.
- BEIER, M. 1964. Die Pseudoscorpioniden-Fauna Chiles. *Annalen des Naturhistorischen Museums Wien* 67: 307-375.
- BEIER, M. 1969. Ein wahrscheinlich troglobionter *Pseudochthonius* (Pseudoscorp.) aus Brasilien. *Revue suisse de Zoologie* 76: 1-2.
- BEIER, M. 1970a. Myrmecophile Pseudoscorpione aus Brasilien. *Annalen des Naturhistorischen Museums Wien* 74: 51-56.
- BEIER, M. 1970b. Trogloxene Pseudoscorpione aus Südamerika. *Anales de la Escuela Nacional de Ciencias Biológicas, Mexico* 17: 51-54.
- BEIER, M. 1974. Brasilianische Pseudoscorpione aus dem Museum in Genf. *Revue suisse de Zoologie* 81: 899-909.
- CHAMBERLIN J.C. & CHAMBERLIN, R. V. 1945. The genera and species of Tridenchthoniidae (Dithidae), a family of the arachnid order Chelonethida. *Bulletin of the University of Utah, Biological Series*, 9(2): 67pp.
- DUMITRESCO, M. & ORGHIDAN, T. 1981. Représentants de la fam. Cheiridiidae Chamberlin (Pseudoscorpionidea) de Cuba. *Résultats des expéditions biospéologiques cubano-roumaines à Cuba* 3: 77-87.
- FEIO, J. L. A. 1941. Sobre um curioso pseudoscorpião *Geogarypus (Geogarypus) itapemiriensis* sp. n. (Garypidae: Neobisiinae). *Papeis avulsos do Departamento de Zoologia, São Paulo*, 1 (26): 241-244.
- GNASPINI, P. 1992. Bat guano ecosystems a new classification and some considerations with special references to Neotropical data. *Mémoires de Biospéologie* 19: 135-138.
- HEURTAULT, J. 1994. Pseudoscorpiones. *Encyclopaedia biospeologica* 1 : 185-196. Société de Biospéologie, Moulis-Bucarest.
- JUDSON, M. L. I. 1992. African Chelonethi. Studies on the systematics, biogeography and natural history of African pseudoscorpions (Arachnida). *Ph.D. thesis, Univ. Leeds*: iv+248p.
- KURY, A. B. & NOGUEIRA, A. L. C. 1999. Annotated check list of type specimens of Arachnida in the Museu Nacional - Rio de Janeiro. I. Scorpiones, Pseudoscorpiones and Solifugae. *Publicações avulsas do Museu Nacional, Rio de Janeiro*, 77: 1-19.
- MAHNERT, V. 1979. Pseudoscorpione (Arachnida) aus dem Amazonas-Gebiet (Brasilien). *Revue suisse de Zoologie* 86: 719-810.
- MAHNERT, V. 1984. Beitrag zu einer besseren Kenntnis der Ideoroncidae (Arachnida: Pseudoscorpiones), mit Beschreibung von sechs neuen Arten. *Revue suisse de Zoologie* 91: 651-686.
- MAHNERT, V. 1985. Pseudoscorpions (Arachnida) récoltés durant la mission spéléologique espagnole au Pérou en 1977. *Revue arachnologique* 6: 17-28.
- MAHNERT, V. 1987. Neue oder wenig bekannte, vorwiegend mit Insekten vergesellschaftete Pseudoscorpione (Arachnida) aus Südamerika. *Bulletin de la Société entomologique suisse* 60: 403-416.
- MAHNERT, V. 1994. New cheretid pseudoscorpions (Pseudoscorpionida: Chernetidae) from Venezuela and Brazil, with remarks on the genus *Ancalochernes* Beier. *Revue suisse de Zoologie* 101: 829-838.

- MAHNERT, V. & ANDRADE, R. DE. 1998. Description of a new troglophilous species of the genus *Maxchernes* Feio, 1960 (Pseudoscorpiones, Chernetidae) from Brazil (Sao Paulo State). *Revne svisse de Zoologie* 105: 771-775.
- MUCHMORE, W. B. 1969. The pseudoscorpion genus *Macrochernes*, with the description of a new species from Puerto Rico (Arachnida, Chelonethida, Chernetidae). *Caribbean Journal of Science and Mathematics* 1: 9-14.
- MUCHMORE, W. B. 1970. An unusual new *Pseudochthonius* from Brazil (Arachnida, Pseudoscorpionida, Chthoniidae). *Entomological News* 81: 221-223.
- MUCHMORE, W. B. 1975. The genus *Lechytia* in the United States (Pseudoscorpionida, Chthoniidae). *The Southwestern Naturalist* 20: 13-27.
- MUCHMORE, W. B. 1998. Review of the family Bochicidae, with new species and records (Arachnida: Pseudoscorpionida). *Insecta Mundi* 12: 117-132.
- MUCHMORE, W. B. 1999. Redefinition of the genus *Chelanops* Gervais (Pseudoscorpionida: Chernetidae). *Pan-Pacific Entomologist* 75: 103-111.
- MUCHMORE, W. B. 2000. The Pseudoscorpionida of Hawaii Part I. Introduction and Chthonioidea. *Proceedings of the Hawaiian entomological Society* 34: 147-162.
- MUCHMORE, W. B. & HENTSCHEL, E. 1982. *Epichernes aztecus*, a new genus and species of pseudoscorpion from Mexico (Pseudoscorpionida, Chernetidae). *Journal of Arachnology* 10: 41-45.
- PINTO-DA-ROCHA, R. 1995. Sinopse da fauna cavernicola do Brasil (1907-1994). *Papeis Avulsos de Zoologia, Sao Paulo*, 39: 61-173.
- STRINATI, P. 1975. Faune des Grutas das Areias (Sao Paulo, Brazil). *International Symposium on Cave Biology and Cave Paleontology, Oudtshoorn*: 37-38.
- TRAJANO, E. 1993. A review of biospeleology in Brazil. *Boletim de la Sociedad Venezolana d'Espeleología* 27: 18-23.
- TRAJANO, E. & GNASPINI-NETTO, P. 1991. Composição da fauna cavernicola brasileira, com uma análise preliminar da distribuição dos taxons. *Revista brasileira de Zoologia* 7: 383-407.
- TRAJANO, E. & SANCHEZ, L. E. 1994. Brésil (pp. 527-540). In: Juberthie, C. & Decu, V. (eds): *Encyclopaedia Biospeologica* 1, Moulis, Soc. Biospéol.